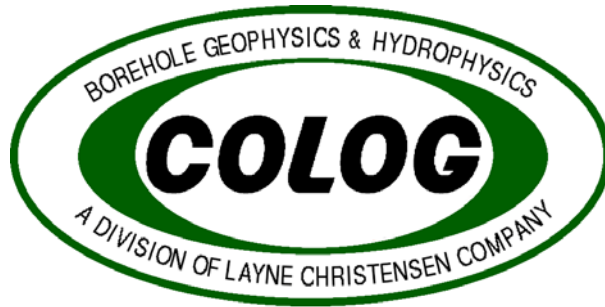


**APPENDIX I**

**COLOG REPORT FOR DOWNHOLE SURVEYS AT BR-I**



**Geophysical Logging Results BR-I  
Sauget Area 1  
Sauget, Illinois**

Prepared for  
**Groundwater Services Inc.**  
November 29, 2005

Prepared by  
COLOG Division of Layne Christensen Company  
810 Quail St. Suite E, Lakewood, CO 80215  
Phone: (303) 279-0171 Fax: (303) 278-0135

Prepared By:

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Edward J. Plute III  
Geophysical Engineer

Reviewed By:

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Greg D. Bauer  
Asst. Gen. Manager/Senior Hydrogeologist

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## **I. Introduction**

On October 5, 2005, Colog performed geophysical logging in well BR-I at Sauget Area 1, Sauget Illinois. The geophysical logging program included: Optical Televiwer, Acoustic Televiwer, 3-Arm Caliper, Fluid Temperature/Resistivity, and Video. The geophysical investigations were performed to a depth of approximately 147 feet. Four-inch diameter PVC casing was in place from the surface to approximately 125 feet, with a 2.5-inch diameter open borehole below. All depths in this report are referenced to ground level.

Section II of this report provides a summary of results of the surveys at BR-I. Section III provides information regarding the theory of operation and the methods for interpreting data from these logging tools.

## **II. BR-I Data Summary**

Optical Televiwer: The technology of this tool is based on direct optical observation of the borehole wall face. At BR-I, the optical televiwer was logged from ground surface to approximately 114.5 feet. The logging of the optical televiwer was stopped at this depth because the image turned black when an oil substance at this depth covered the camera lens. The log shows the inside of casing and is relativity featureless with the exception of casing joints and water level at approximately 27.5 feet. Casing joints were observed at approximately 3.9, 13.9, 23.9, 34.0, 44.0, 54.1, 64.1, 74.2, 84.2, 94.2, and 104.2 feet. The casing joints appeared to be flush with the casing surface. A featureless optical log indicates that the inside of the casing is in good condition. The log is shown on the Optical Televiwer Plot.

Acoustic Televiwer: This tool transmits ultrasonic pulses from a rotating sensor and records the signals reflected from the interface between the borehole fluid and the borehole wall. The travel time of these reflections represents the borehole shape and diameter, while the amplitude is representative of the hardness of the formation surrounding the borehole. The logs change from blue to red to yellow as the acoustic travel time and acoustic amplitude values increase from smaller values to larger values.

Planar features that intersect the borehole wall appear as sinusoids on the acoustic televiwer log image. Processing of the log was conducted using interactive software to calculate orientation and dip angle of each acoustic feature and to determine the depth of each feature. The acoustic features were then ranked from 0 to 5 using a ranking system that was based on a system developed by USGS. The ranking system and associated color codes are summarized on Ranking System for Acoustic Televiwer Features. This ranking system was applied as a subjective evaluation of permeability potential. In general, the higher the rank the greater the likelihood of fracture interconnection and subsequent increased permeability. On the Acoustic Televiwer Plot the acoustic features are indicated by color-coded sinusoids and dots. Each dot has a tail that indicates the dip direction of the acoustic feature.

At BR-I the acoustic televiwer was logged from approximately 113 to 145 feet to find features in the open portion of the well that the optical televiwer was unable to log. A change in acoustic travel time and amplitude at a depth of 114.8 feet occurred at approximately the same

depth that an oil substance covered the camera lens during the optical televiewer survey. Within the open borehole, a total of forty-two acoustic features were observed at depths between 125.2 ft and 144.4 ft, as summarized on the Orientation Summary Table. There were thirteen features with a rank of 3 on the USGS ranking system (i.e., distinct feature with apparent aperture) and there was one feature, at a depth of approximately 137.1 ft, with a rank of 4 (i.e., very distinct, wide possible interconnected fracture). Four high angle features with a dip angle greater than 45° were also identified on the log. Dip directions and dip angles of the forty-two acoustic features identified in BR-I are summarized on the Rose Diagrams.

On the Acoustic Televiewer Plot, the travel time and acoustic amplitude changes that are observed between about 124.75 ft and 126.5 ft occur in the same depth interval where there are observed changes in the caliper log, and it was in this approximate depth interval where the bottom of the PVC casing was reportedly installed. The following discussion of caliper log results provides further interpretation of the observed features in this depth interval.

Three-Arm Caliper: The caliper tool has three spring-loaded arms, and the amount of extension of these arms is used to determine the average borehole diameter. At BR-I the caliper tool was run from total well depth to the ground surface, and the results are shown on the Geophysical Summary Plot.

The open-hole portion of the well has a diameter of approximately 2.5 inches, and the inside of the PVC casing has a diameter of approximately 3.5 inches. The open-hole portion is featureless with the exception of a spike at 137.2 feet. This feature corresponds to the highest rank feature identified in the acoustic televiewer log (i.e., the acoustic feature at a depth of 137.1 feet that had a rank of 4 on the subjective USGS ranking system).

From approximately 124.5 to 126.5 feet there is an uneven transition in the caliper log. To better illustrate this region of the borehole, the three-arm caliper log is shown next to the acoustic televiewer log on Acoustic Televiewer Image Plot 2.

Based on review of the caliper and acoustic televiewer logs, it appears that the bottom of the PVC casing is at a depth of approximately 124.75 feet. Below casing the caliper shows that the borehole diameter decreases from approximately 124.75 to 125.25 feet where there is an anomaly of larger diameter of 3.5 inches. The smaller diameter anomaly at approximately 124.75 to 125.25 feet on the caliper log is of particular note. No conclusion can be drawn directly from this data set regarding it, however, the decrease in diameter is indicative of a resistive layer at this depth. The data suggests that a washout of some kind exists below casing to approximately 126.6 feet. Whether the larger diameter is a result of drilling practices or a function of lithology cannot be discerned, however, a higher density of fractures is present in this interval with respect to the remainder of the borehole and this may suggest the latter.

The integrity of the inside of the PVC casing appears to be sound based on the ATV and caliper logs. The horizontal line observed on the ATV amplitude log at 124.65 feet is typical of the end of casings, usually an indication the machined end of the casing or possibly the start of threads.

Fluid Temperature and Conductivity: This tool measures temperature and conductivity of the

fluid surrounding the probe as it is lowered down the borehole. The exchange of fluid between the formation and the borehole can influence both the temperature and the conductivity so that a response can sometimes be seen on both logs. At BR-I temperature and fluid conductivity were logged from approximately 27 feet to 147 feet, and the results are shown on the Geophysical Summary Plot.

Both logs are relatively featureless. Fluid conductivity is approximately 1200 uS/cm from 27 to 114.5 feet, where it sharply decreases to 100 uS/cm. This change in conductivity occurs at the same depth where an oil substance covered the camera lens on the optical televiewer. It is possible the oil covered the conductivity sensor at this depth interfering with the conductivity measurement for the remainder of the borehole.

The temperature log decreases with depth until approximately 100 feet where it becomes relatively steady for the remainder of the well. From 100 to 147 feet the fluid temperature values are between 14.9°C and 15.1°C showing minimal variation in the temperature in the open-hole section of the well. Therefore, the data suggests that flow is unlikely in open-hole section of the borehole.

Video: A video survey was recorded at BR-I using a downhole camera device that was lowered into the well for direct visual observation of the casing. The video survey was stopped just above the depth where the oil substance was observed on the optical televiewer. The output from this survey was a videotape in VHS format. The video survey provided no new information beyond that which was obtained by the optical televiewer.

### **III. Methodology**

#### **A. Optical Televiewer (BIPS or OBI)**

The optical televiewer provides the highest resolution available for fracture and feature analysis in boreholes. This technology is based on direct optical observation of the borehole wall face. Precise measurements of dip angle and direction of bedding and joint planes, along with other geological analyses, are possible in both air and clear fluid filled boreholes.

#### **Theory of Operation**

A small light ring illuminates the borehole wall allowing a camera to directly image the borehole wall face. A conical mirror housed in a clear cylindrical window focuses a 360° optical “slice” of the borehole wall into the camera’s lens. As the optical televiewer tool is lowered down the hole, the video signal from this camera is transmitted uphole via the wireline to the optical televiewer surface instrumentation.

The signal is digitized in real time by capturing 360 pixels around a 0.01 foot ring from the conical image. The rings are stacked and unwrapped to a 2-D image of the borehole wall. A digital 3-axis magnetometer and 2-axis accelerometer package is used to determine the orientation of the digital image.

The optical televiewer image is an oriented, 2-D picture of the borehole wall unwrapped from south to south or north to north depending on the software used (Figure 1). Planar features that intersect the borehole appear to be sinusoids on the unwrapped image. To calculate the dip angle of a fracture or bedding feature the amplitude of the sinusoid ( $h$ ) and the borehole diameter ( $d$ ) are required. The angle of dip is equal to the arc tangent of  $h/d$ , and the dip direction is picked at the trough of the sinusoid (Figure 1).

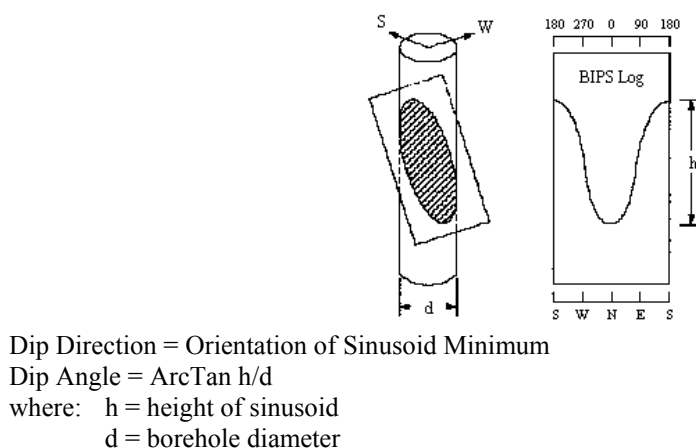


Figure 1: Geometric representation of a north dipping fracture plane and corresponding log.

Sinusoidal features were picked throughout wells by visual inspection of the digital optical televiewer images using interactive software. The software performed the orientation calculations and assigned depths to the fractures or bedding features at the inflection points (middles) of the sinusoids. Features were subjectively ranked for flow potential using COLOG's Ranking System for optical televiewer features included in this report. The features picked along with their assigned ranks, orientations and depths are presented in tables for each well. Orientations are based on magnetic north and are corrected for declination. The Stereonet plots and Rose Diagrams provide useful information concerning the statistical distribution and possible patterns or trends that may exist from the optical televiewer feature orientations.

### Interpreting Optical Televiewer Data

Data acquired from the optical televiewer is typically in the form of dip direction/dip angle, i.e. 230/45. When plotted in 2-D color, the fractures and features intersecting the borehole appear as sinusoids as discussed above. The data can also be displayed as a Tadpole plot where the structure log is displayed as a tadpole style arrow plot. In this mode the position of the body of the tadpole with respect to the horizontal log scale gives the degree of tilt of the structure whilst the angle of the tadpole tail with respect to the vertical gives the azimuth of the structure. Using the software program WellCAD version 3.2, the user identifies the features/fractures and has the software assign and record a dip angle and direction based on the above algorithm as described in the "Theory" section. The data can easily be converted into table format for display in Excel or any tabular editing program. From the data table, rose diagrams and/or stereonet can be generated if requested.

## Rose Diagrams

A rose diagram is a polar diagram in which radial length of the petals indicates the relative frequency (percentage) of observation of a particular angle or fracture dip direction or range of angles or dip directions. Rose diagrams are used to identify patterns (if any) in the frequency of dip angles or directions for a particular data set. Figures 2 and 3 are example rose diagrams from an optical televiewer data set of fractures and features.

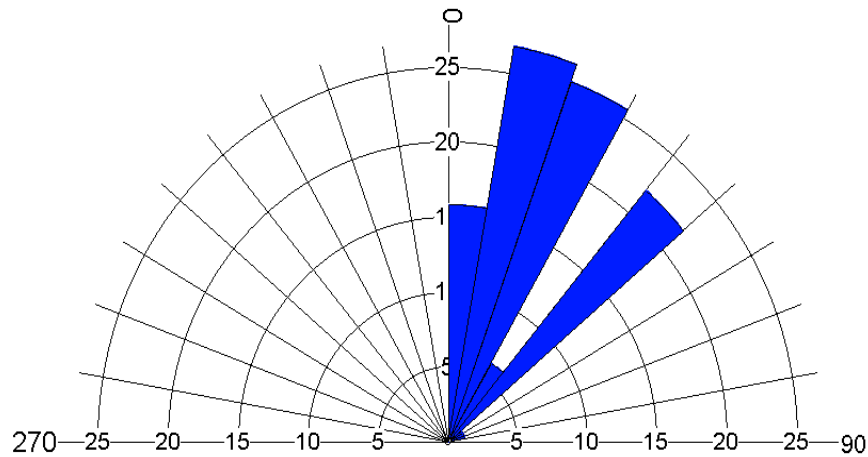


Figure 2: Example rose diagram from an optical televiewer data set illustrating the frequency (%) of dip angles.



Figure 2 above indicates, from an example data set, that approximately 16 percent of the fractures/features have a dip angle between 0 and 10 degrees, approximately 27 percent of the fractures/features have a dip angle between 11 and 20 degrees, approximately 25.5 percent between 21 and 30 degrees, approximately 6 percent between 31 and 40 degrees and 22 percent between 41 and 50 degrees. A quick glance at Figure 2 identifies a pattern of dip angle where greater than 50 percent of the fracture/features identified have a dip angle between 11 and 30 degrees. Additionally, no high-angle (greater than 50 degrees) fractures/features were identified from this data set.

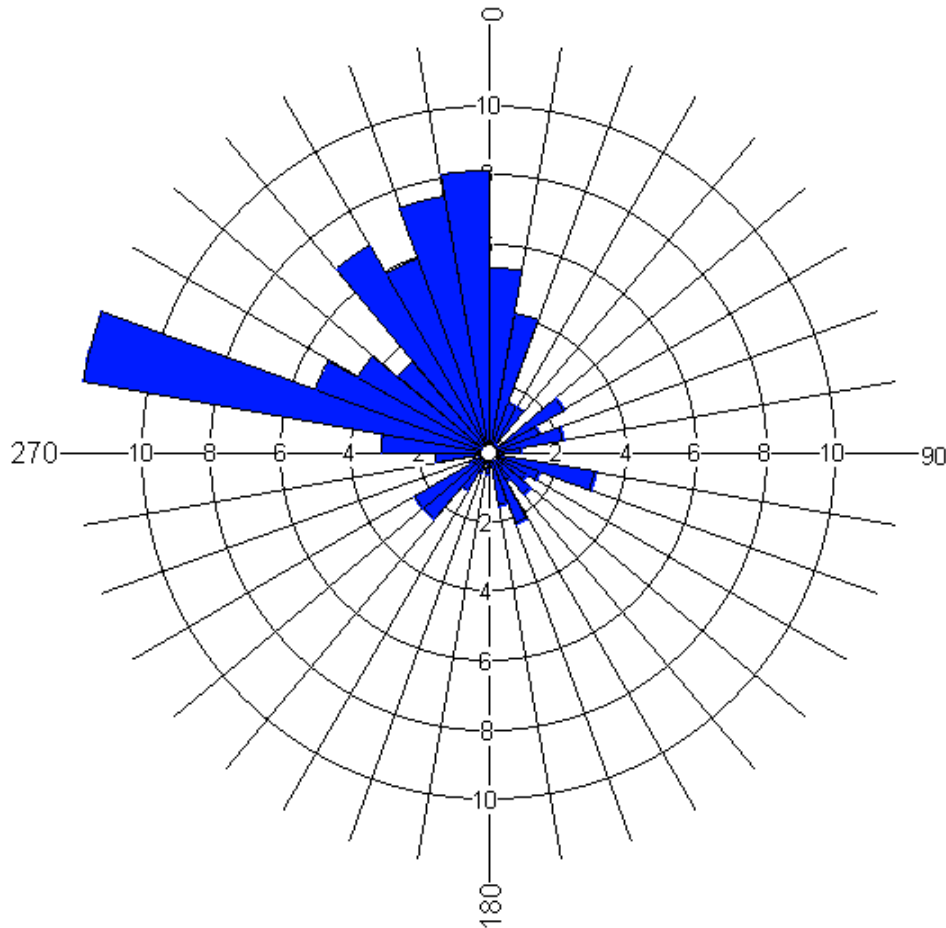


Figure 3: Example rose diagram from an optical televiewer data set illustrating the frequency (%) of dip direction.

Figure 3 (example data set) above indicates, with a quick glance, that the majority of the fractures/features dip in the direction of northwest. Specifically, approximately 62 percent of the identified fractures/features have a dip direction of 280 degrees (west) to 20 degrees (north).

## Stereonets

For stereonets, COLOG utilizes a Schmidt net, an equal-area plot of longitude and latitude used in plotting geologic data such as the direction of structural features. Here, the angle indicates dip direction and the distance from the center indicates the dip magnitude. The further from the center the shallower the dip angle. Figure 4 below is an example stereonet diagram from an acoustic televiewer data set of fractures and features.

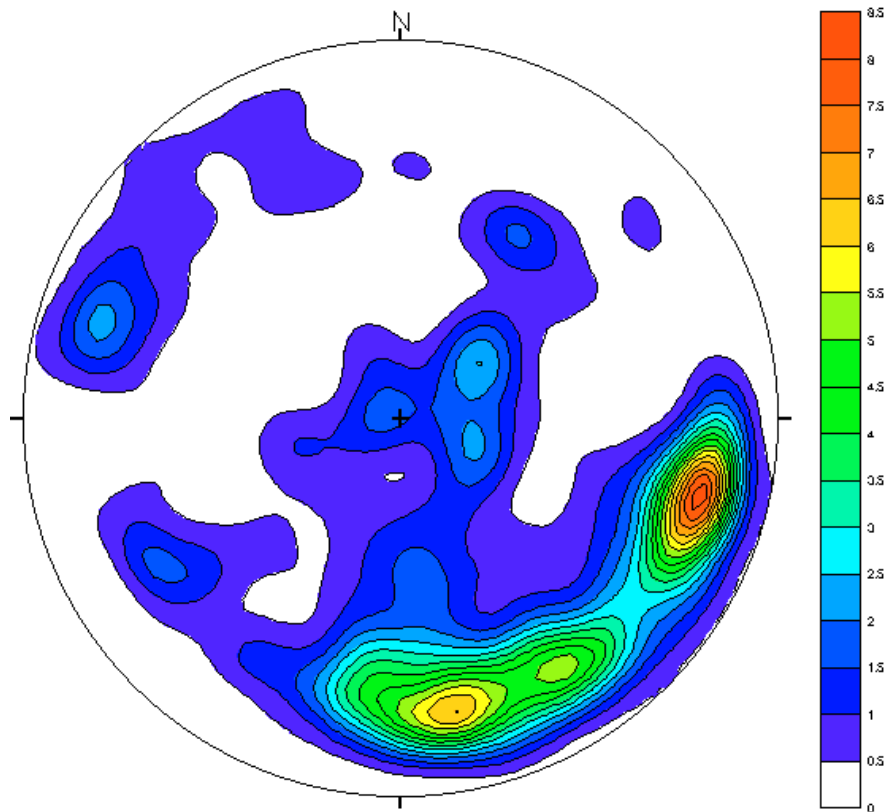


Figure 4: Example stereonet from an optical televiewer data set illustrating the frequency (%) of dip direction and dip angle in 2-D space.

Figure 4 above indicates, with a quick glance, that two distinct patterns exist in the example data set. A cluster of fractures/features with similar dip direction of approximately 110 degrees and similar shallow dip angles is apparent. A second cluster, slightly less dense, is apparent with similar dip directions of approximately 170 degrees (almost due south) and similarly shallow dip angles.

Please refer to the following Ranking System for Optical Televiewer Features for an explanation of the qualitative ranks assigned each optical televiewer feature identified.

## B. Acoustic Televiewer

The FAC-40 ATV, from Advanced Logic Technologies (ALT), provides a detailed, oriented image of acoustic reflections from the borehole wall. A unique focusing system resolves bedding features as small as 2 mm and is capable of detecting fractures with apertures as small as 0.1 mm. The acoustic image is precisely oriented using a 3-axis magnetometer with dual accelerometers, which also combine to measure deviation (or drift) of the borehole trajectory.

### Theory

The FAC-40 transmits ultrasonic pulses from a rotating sensor and records the signals reflected from the interface between the borehole fluid and the borehole wall (Figure 5). The amplitude of these reflections is representative of the hardness of the formation surrounding the borehole, while the travel time represents the borehole shape and diameter. As many as 288 reflections may be recorded per revolution at up to 12 revolutions per second. The digital amplitude or travel time data are presented using a variety of color schemes that represent the borehole wall.

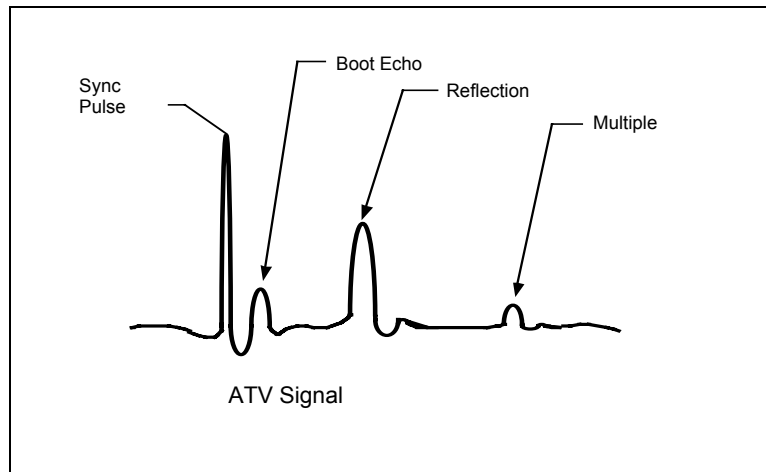


Figure 5: Returned signal.

This ATV image is an oriented, 2-D picture of the borehole wall unwrapped from north to north (Figure 6). Planar features that intersect the borehole appear to be sinusoids on the unwrapped image. To calculate the dip angle of a fracture or bedding feature the amplitude of the sinusoid ( $h$ ) and the borehole diameter ( $d$ ) are required. The angle of dip is equal to the arc tangent of  $h/d$ , and the dip direction is picked at the trough of the sinusoid (Figure 6).

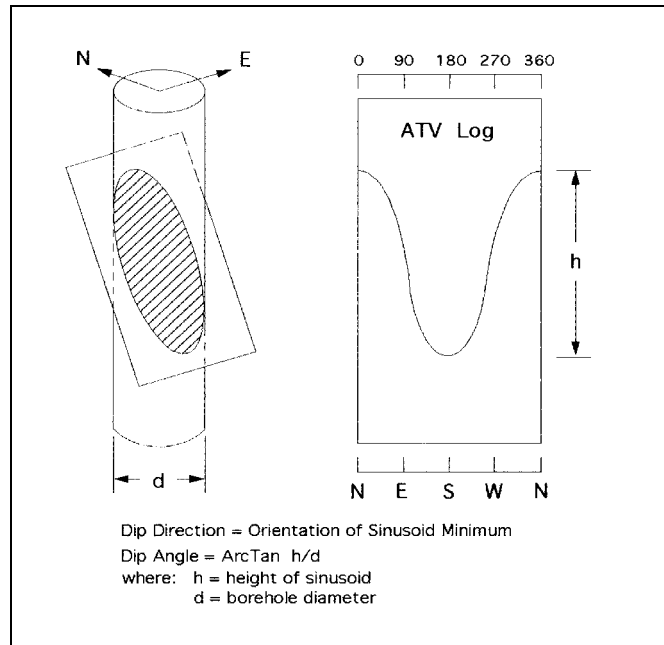


Figure 6: Geometric representation of a fracture plane and corresponding ATV log.

Sinusoidal features are picked by visual inspection of the amplitude and travel time images using interactive software called WellCAD, version 3.2. The software performs the orientation calculations and assigns a depth to the fracture or bedding feature at the inflection point (middle) of the sinusoid. Features may be subjectively ranked for flow potential using the ranking system developed by the USGS presented in *Ranking System for Acoustic Televiewer Features*, shown on the next page. Statistical analysis of the fracture/feature data such as stereonet plots and rose diagrams provide useful information concerning the statistical distribution and possible patterns or trends that may exist in the set of fracture/feature orientations.

## Applications

The high resolution reflection images and the precise travel time measurements make the FAC-40 ATV a versatile tool. Possible applications include:

- Fracture detection and evaluation
- Detection of thin beds
- Determination of bedding dip
- Lithological characterization
- Casing inspection
- High resolution caliper measurements

### **C. 3-Arm Caliper**

The caliper log represents the average borehole diameter determined by the extension of 3 spring-loaded arms. The measurement of the borehole diameter is determined by the change in the variable pot resistors in the probe, which are internally connected to the caliper arms.

Caliper logs may show diameter increases in cavities and, depending on drilling techniques used, in weathered zones. An apparent decrease in borehole diameter may result from mud or drill-cutting accumulation along the sides of the borehole (mudcake), a swelled clay horizon or a planned change in drill bit size. The bottom of the boring can also induce a small diameter reading from the caliper due to the caliper leaning up against on side of the borehole. The caliper log is often a useful indicator of fracturing. The log anomalies do not directly represent the true in-situ fracture size or geometry. Rather, they represent areas of borehole wall breakage associated with the mechanical weakening at the borehole-fracture intersection. Caliper anomalies may represent fractures, bedding planes, lithologic changes or solution openings. Generally, in solid bedrock caliper log anomalies indicate the intervals where fractures intersect boreholes.

COLOG records the caliper log with either a single-arm caliper measurement using the decentralization arm of the density probe or a separate stand-alone three-arm caliper. Calibrations of the probe are done routinely on the bench and in the field directly before the tool is placed into the borehole. Calibration standards consist of rings of known diameters that are placed over the extended arms as the tool response at these diameters is recorded. Additionally, as with other geophysical measurements, a repeat section may be collected and compared with original logs for consistency and accuracy.

Fundamental assumptions and limitations inherent in these procedures are as follows:

- Since the caliper probe is an electro-mechanical device, a certain amount of error is inherent in the measurement. These errors are due to: 1) averaging hole diameter using three arms, 2) non-linearity of the measurement resistor, 3) tolerance in the mechanical movement of the caliper arms (mechanical hysteresis).

### **D. Fluid Temperature/Resistivity**

Geothermal gradients in the near surface earth are usually dominated by conduction, and are generally linear increasing with depth due to the relative constancy of the thermal conductivity of earth materials. Convective heat flow within the borehole fluid is caused by formation fluid entering or leaving the borehole at some permeable interval. Therefore, deviations from the linear thermal gradient can be attributed to fluid movement. Both the thermal gradient and fluid resistivity profile of the borehole fluid can be obtained with the same probe. The temperature is measured with a thermistor and the fluid resistivity is measured with a closely spaced Wenner electrical array.

Slope changes in both the temperature and fluid resistivity logs may be indicative of fluid flow between the formation and the borehole. Both responses are effected by drilling method, time since circulation, mud type or additives and well development procedures.

The fluid resistivity in the borehole is controlled primarily by the salinity. Therefore, salinity stratification, or the introduction of a fluid of different water quality into the borehole, can be observed by changes in the fluid resistivity log. Often, the exchange of fluid between the formation and the borehole, influences both the temperature and the fluid resistivity so that the response is evident in both logs.

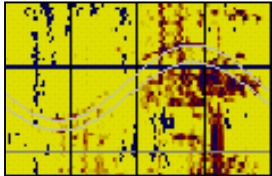
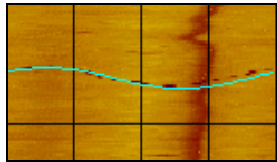
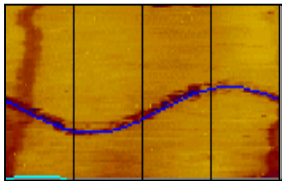
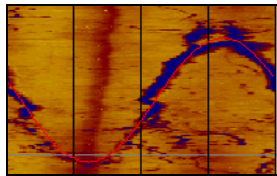
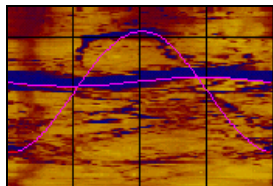
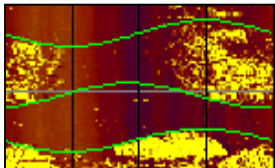
Fundamental assumptions and limitations inherent in these procedures are as follows:

- The borehole temperature log is usually the first log run in a borehole and, unlike virtually all other logs, is run while the probe is moving down the hole. The exception to running this probe first, however, would be if any optical measurement is to be acquired. The idea is that the logging of the temperature/resistivity probe may stir up the wellbore fluids inhibiting the optical device.
- The recorded borehole temperature is only that of the fluid surrounding the probe, which may or may not be representative of the temperature in the surrounding rocks.
- In most wells the geothermal gradient is considerably modified by fluid movement in the borehole and adjacent rocks.
- Temperature logs are generally recommended for uncased fluid-filled boreholes, but may be used in fluid-filled cased wells for some applications.

#### **IV. Limitations**

COLOG's logging was performed in accordance with generally accepted industry practices. COLOG has observed that degree of care and skill generally exercised by others under similar circumstances and conditions. Interpretations of logs or interpretations of test or other data, and any recommendation or hydrogeologic description based upon such interpretations, are opinions based upon inferences from measurements, empirical relationships and assumptions. These inferences and assumptions require engineering judgment, and therefore, are not scientific certainties. As such, other professional engineers or analysts may differ as to their interpretation. Accordingly, COLOG cannot and does not warrant the accuracy, correctness or completeness of any such interpretation, recommendation or hydrogeologic description. All technical data, evaluations, analysis, reports, and other work products are instruments of COLOG's professional services intended for one-time use on this project. Any reuse of work product by Client for other than the purpose for which they were originally intended will be at Client's sole risk and without liability to COLOG. COLOG makes no warranties, either express or implied. Under no circumstances shall COLOG or its employees be liable for consequential damages.

## Ranking System for Acoustic Televiewer Features

	<b>Rank</b>	<b>Color Code</b>	<b>Observation</b>	<b>Flow Rating System</b>
	<b>0</b>	<b>Gray</b>	<b>Non-flow feature</b> <b>(bedding, healed fracture, vein, etc.)</b>	<b>Sealed, no flow</b>
	<b>1</b>	<b>Cyan</b>	<b>Weak feature</b> <b>(not continuous around the borehole)</b>	<b>Partial open crack</b>
	<b>2</b>	<b>Blue</b>	<b>Clean, distinct feature</b>	<b>Continuous Open crack</b>
	<b>3</b>	<b>Red</b>	<b>Distinct feature with apparent aperture</b> <b>(visible on travel-time image)</b>	<b>Wide open crack Or cracks</b>
	<b>4</b>	<b>Magenta</b>	<b>Very distinct, wide possible interconnected fracture</b>	<b>Very wide crack or multiple interconnected fractures</b>
	<b>5</b>	<b>Green</b>	<b>Major fracture zone, visible on both the amplitude and travel time images</b>	<b>Major fracture with large openings or breakouts</b>

This ranking system is based on a system developed and applied by Paillet (USGS, WRD, Borehole Research Project) as a subjective evaluation of permeability potential. In general, the higher the rank, the greater the likelihood of fracture interconnection and subsequent increased permeability.

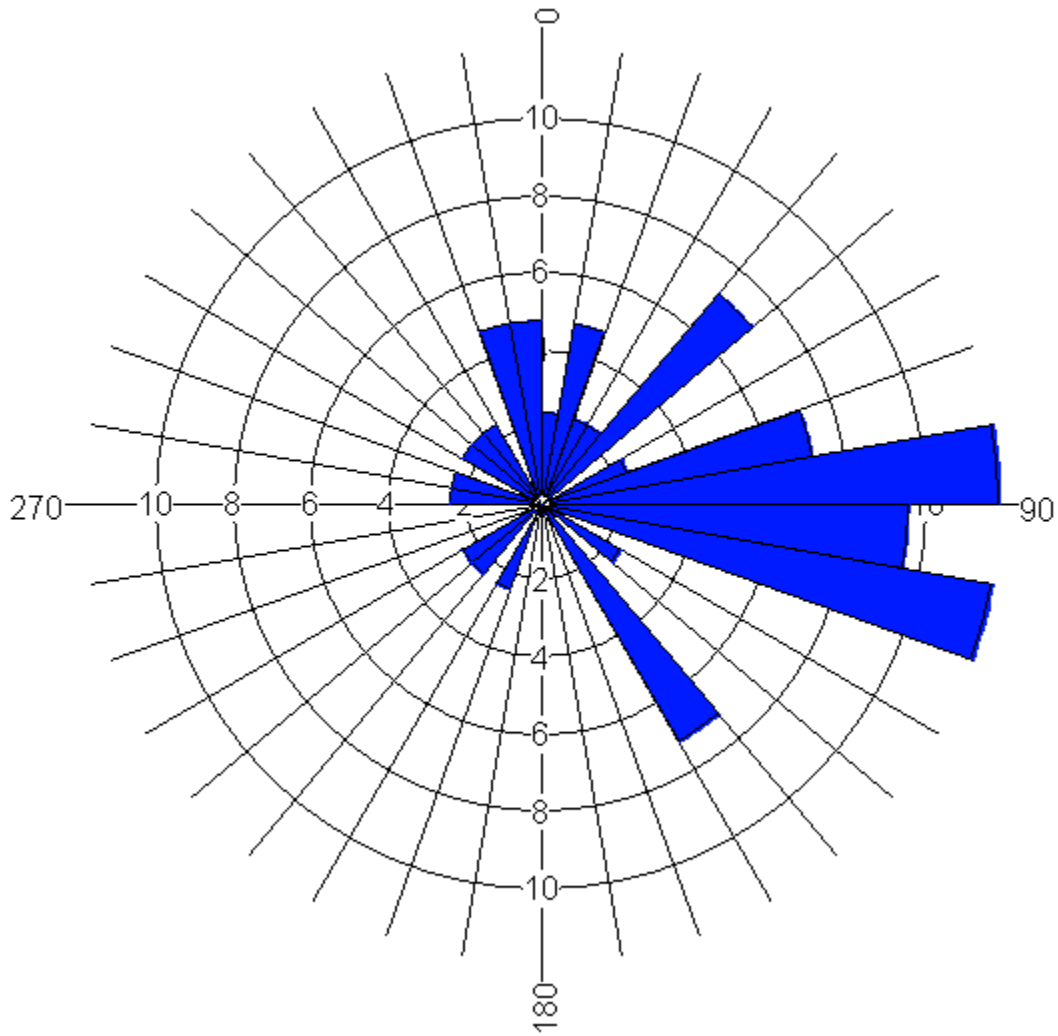
**Orientation Summary Table**  
**Acoustic Features**  
**Well: BR-I, Sauget Area 1**  
**5 October, 2005**

<b>Feature No.</b>	<b>Depth (meters)</b>	<b>Depth (feet)</b>	<b>Dip Direction (degrees)</b>	<b>Dip Angle (degrees)</b>	<b>Feature Rank (0 to 5)</b>
1	38.15	125.2	358	69	1
2	38.19	125.3	95	46	3
3	38.29	125.6	276	26	3
4	38.38	125.9	60	63	1
5	38.41	126.0	209	14	2
6	38.53	126.4	235	5	3
7	38.58	126.6	140	10	3
8	38.61	126.7	146	6	3
9	38.65	126.8	86	14	1
10	38.69	127.0	92	5	3
11	39.16	128.5	286	32	3
12	39.19	128.6	105	16	1
13	39.44	129.4	47	12	1
14	39.67	130.1	326	2	1
15	39.85	130.7	315	5	1
16	40.19	131.9	100	15	3
17	40.24	132.0	80	11	1
18	40.28	132.1	101	14	3
19	40.73	133.6	342	4	1
20	40.75	133.7	146	2	1
21	41.05	134.7	16	4	3
22	41.07	134.7	99	10	1
23	41.08	134.8	79	11	1
24	41.24	135.3	121	20	1
25	41.48	136.1	4	13	1
26	41.79	137.1	100	5	4
27	41.83	137.3	82	7	3
28	41.87	137.4	109	5	2
29	41.89	137.4	41	4	2
30	42.01	137.8	98	10	3
31	42.27	138.7	300	8	1
32	42.33	138.9	352	33	1
33	42.42	139.2	76	18	1
34	42.49	139.4	222	25	1
35	42.58	139.7	12	11	1
36	42.93	140.9	21	34	1
37	42.94	140.9	36	13	1
38	42.98	141.0	47	8	2
39	43.32	142.1	345	80	1
40	43.65	143.2	78	8	1
41	43.96	144.2	86	15	3
42	44.03	144.4	82	41	1

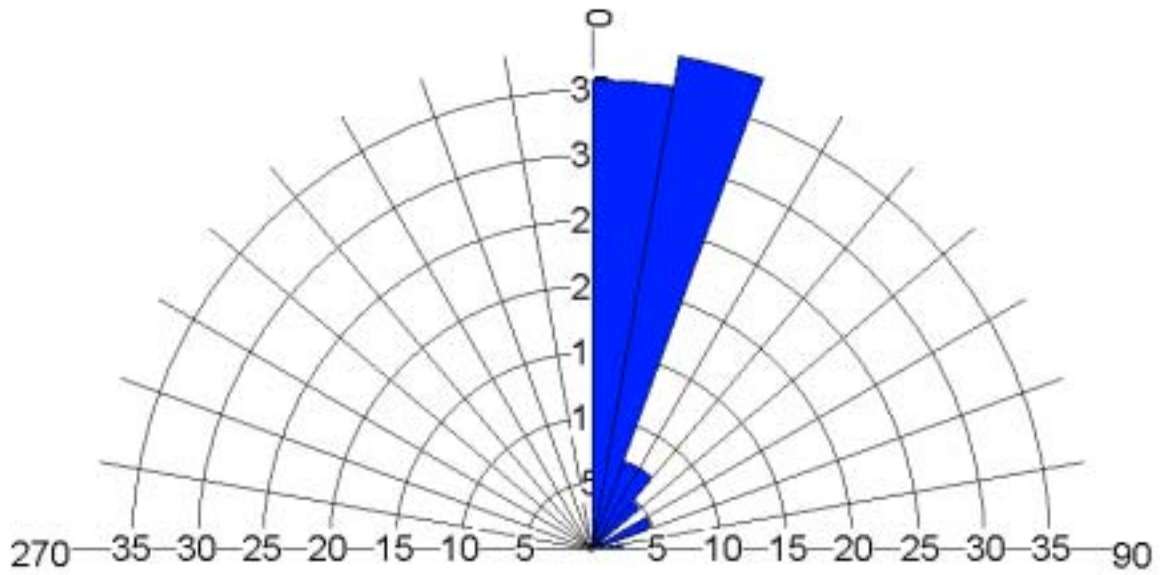
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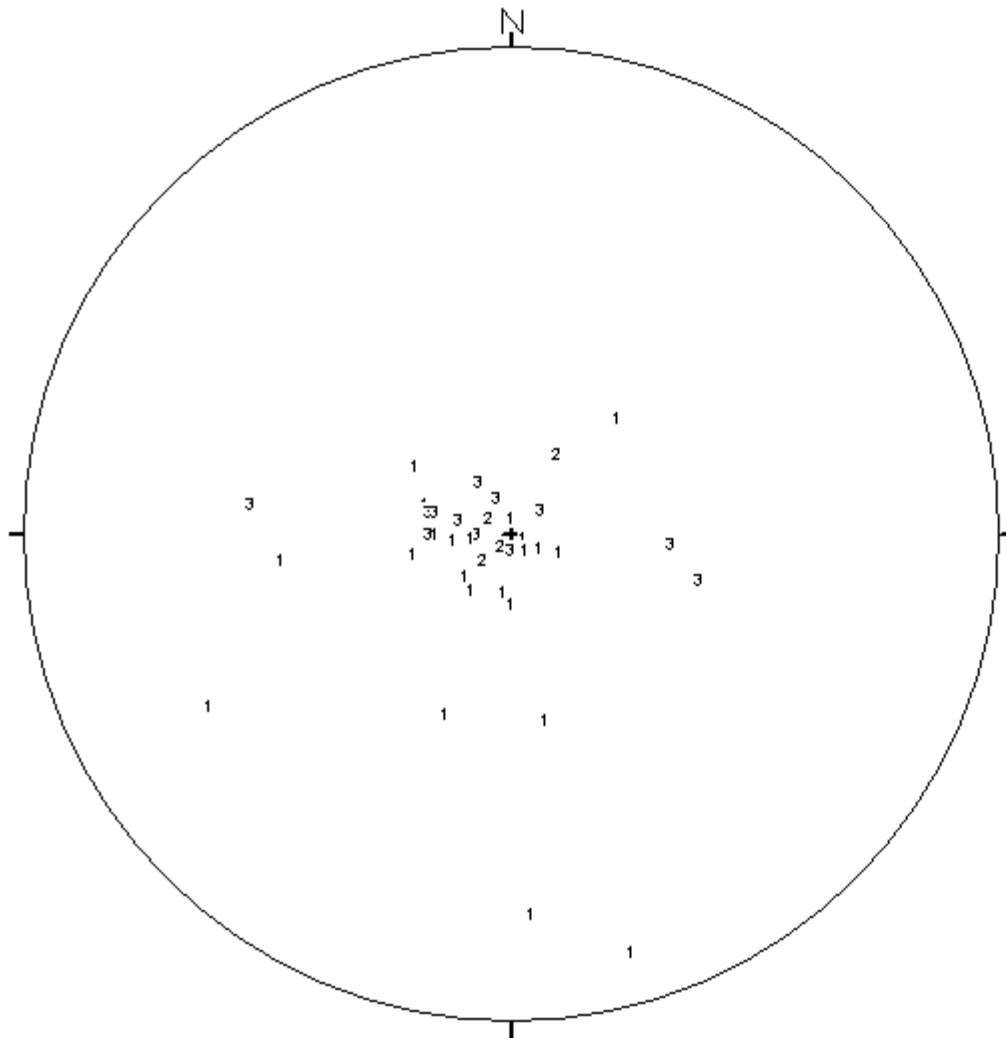
**Rose Diagram – Dip Directions**  
**Acoustic Features**  
**Well: BR-I, Sauget Area 1**  
**5 October 2005**



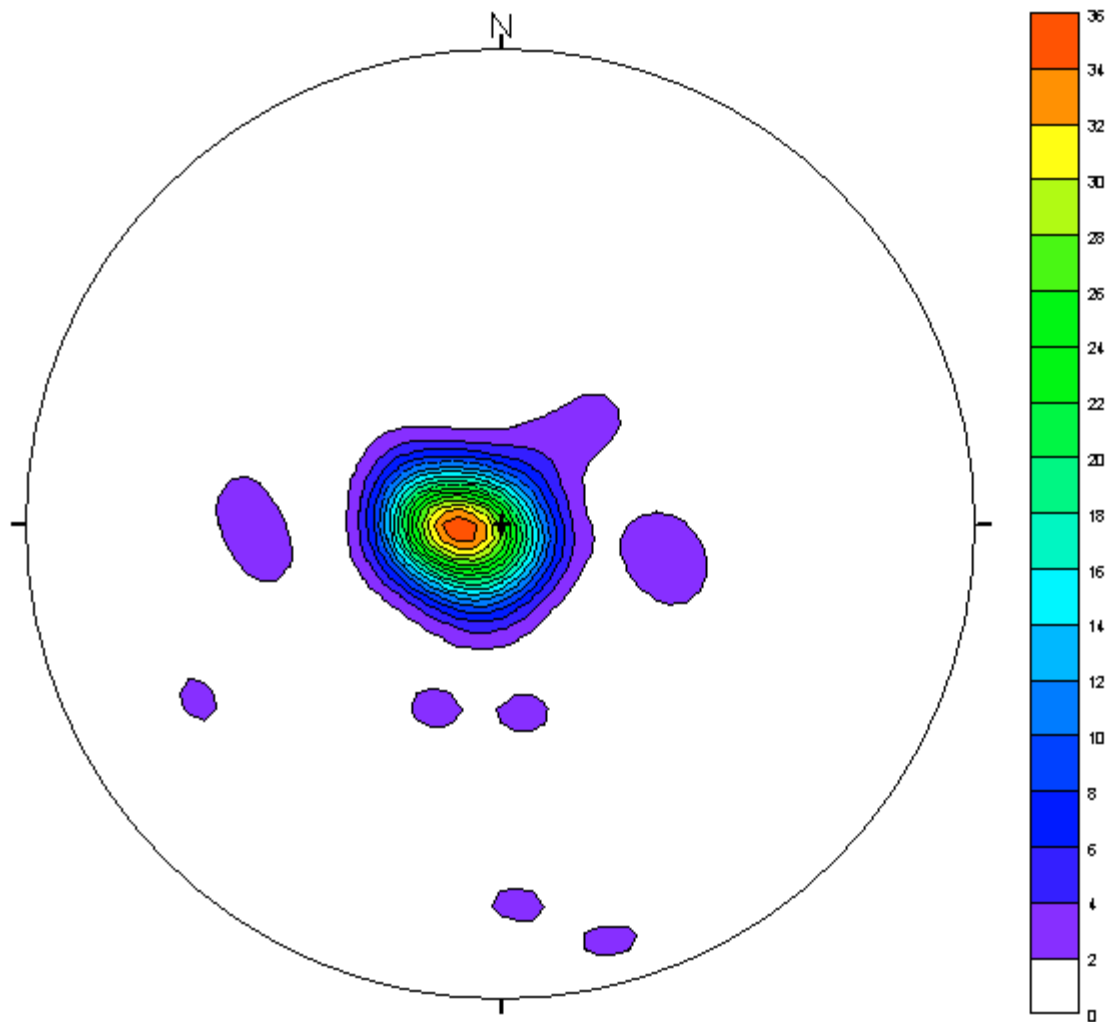
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**Acoustic Features**  
**Well: BR-I, Sauget Area 1**  
**5 October 2005**

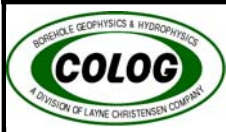


**Stereonet Diagram – Schmidt Projection**  
**Acoustic Features**  
**Well: BR-I, Sauget Area 1**  
**5 October 2005**



**Stereonet Diagram – Schmidt Projection**  
**Acoustic Features**  
**Well: BR-I, Sauget Area 1**  
**5 October 2005**





# Optical Borehole Image Plot

COMPANY: GSI

PROJECT: Sauget Area 1

DATE LOGGED: 5 October 2005

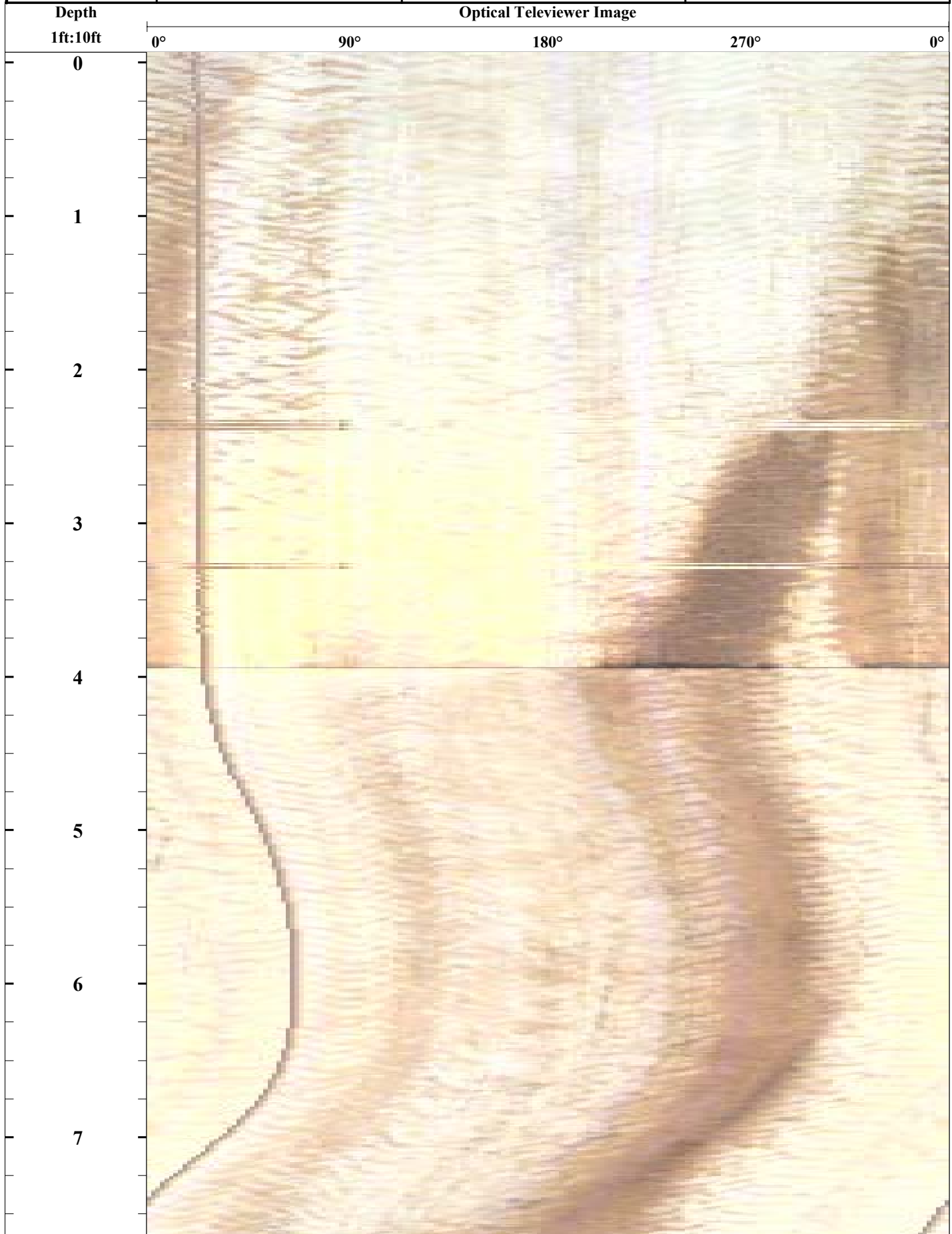
WELL: BR-I

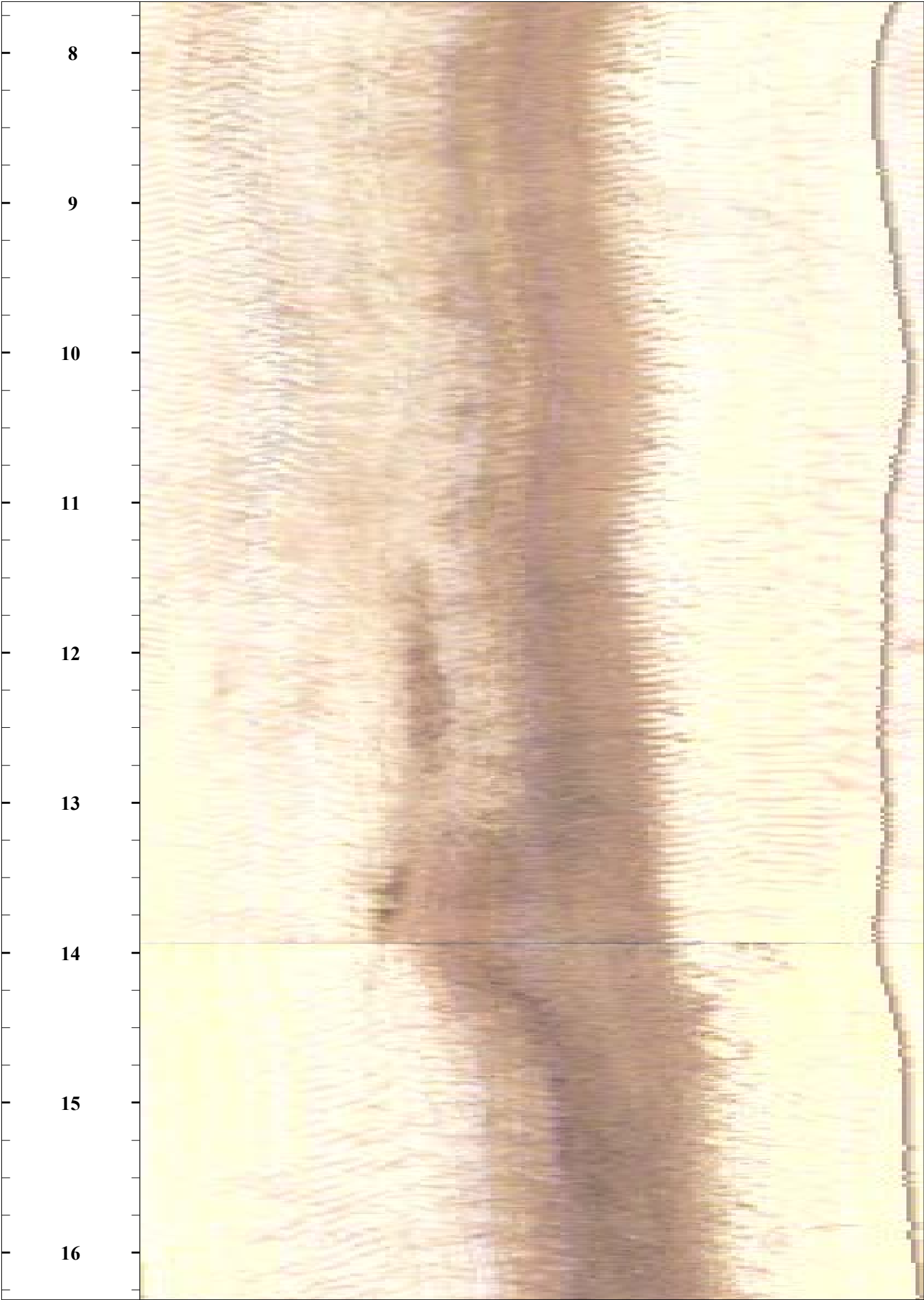
COLOG Main Office

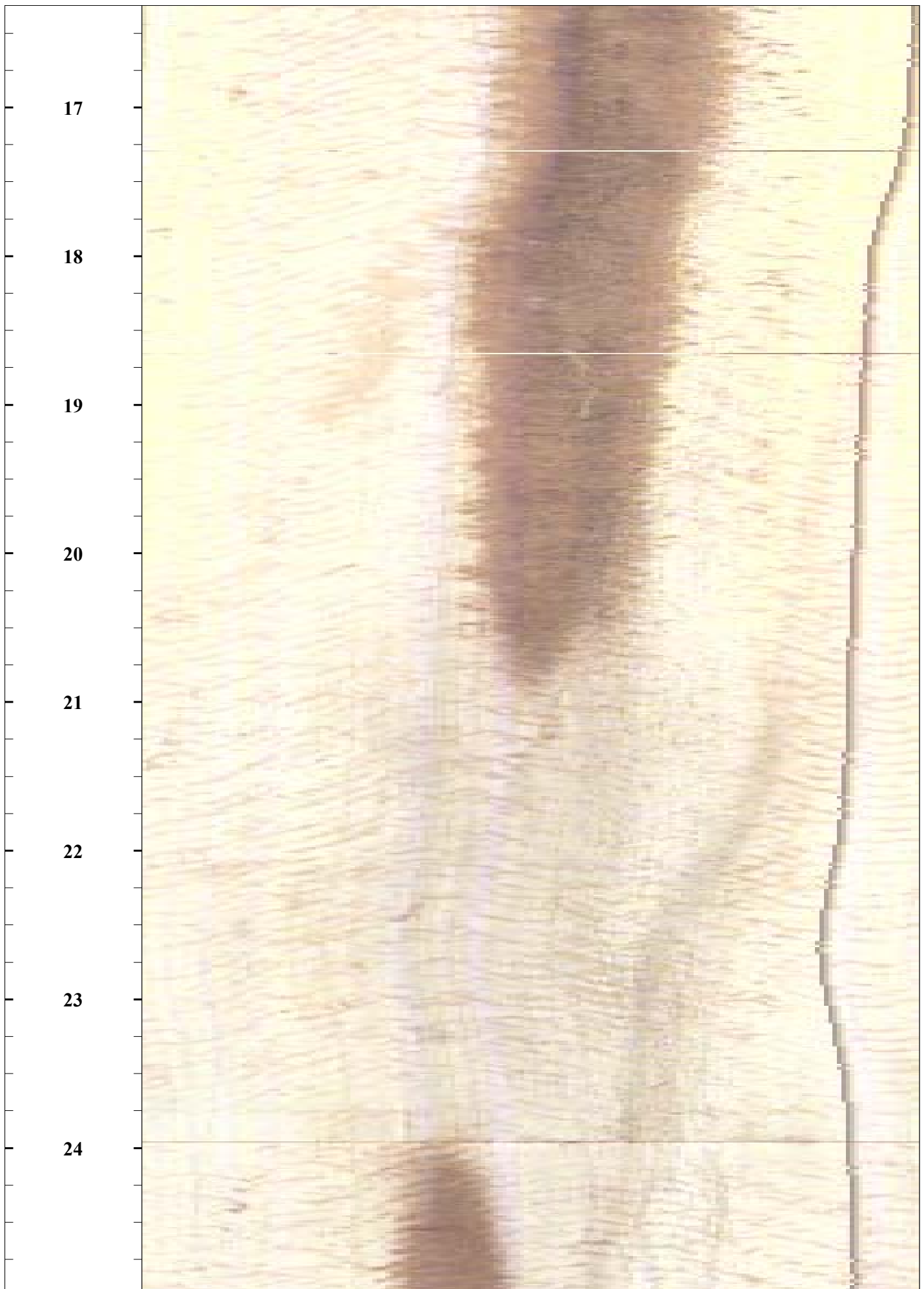
17301 W. Colfax Ave, Ste 265, Golden, CO 80401

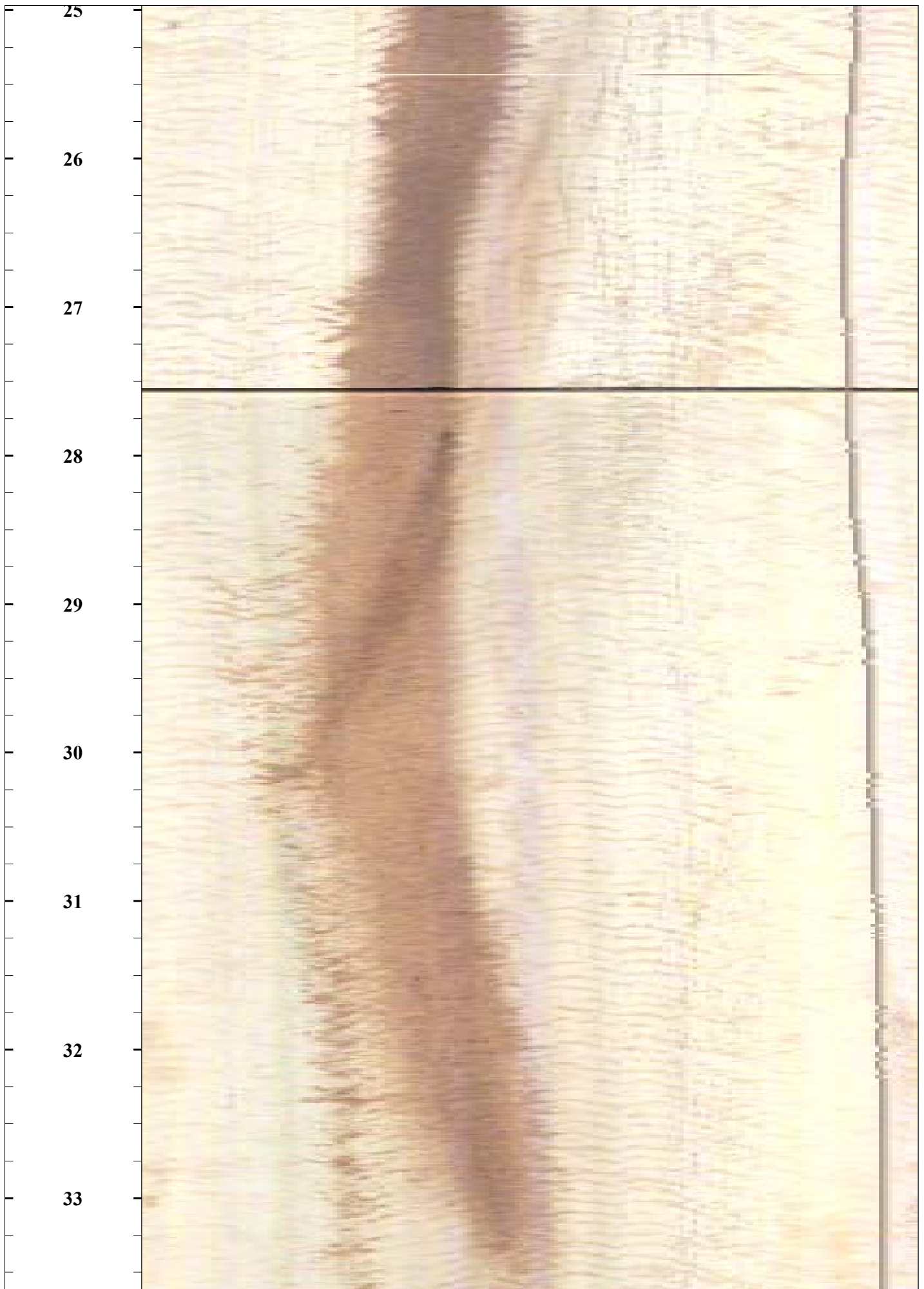
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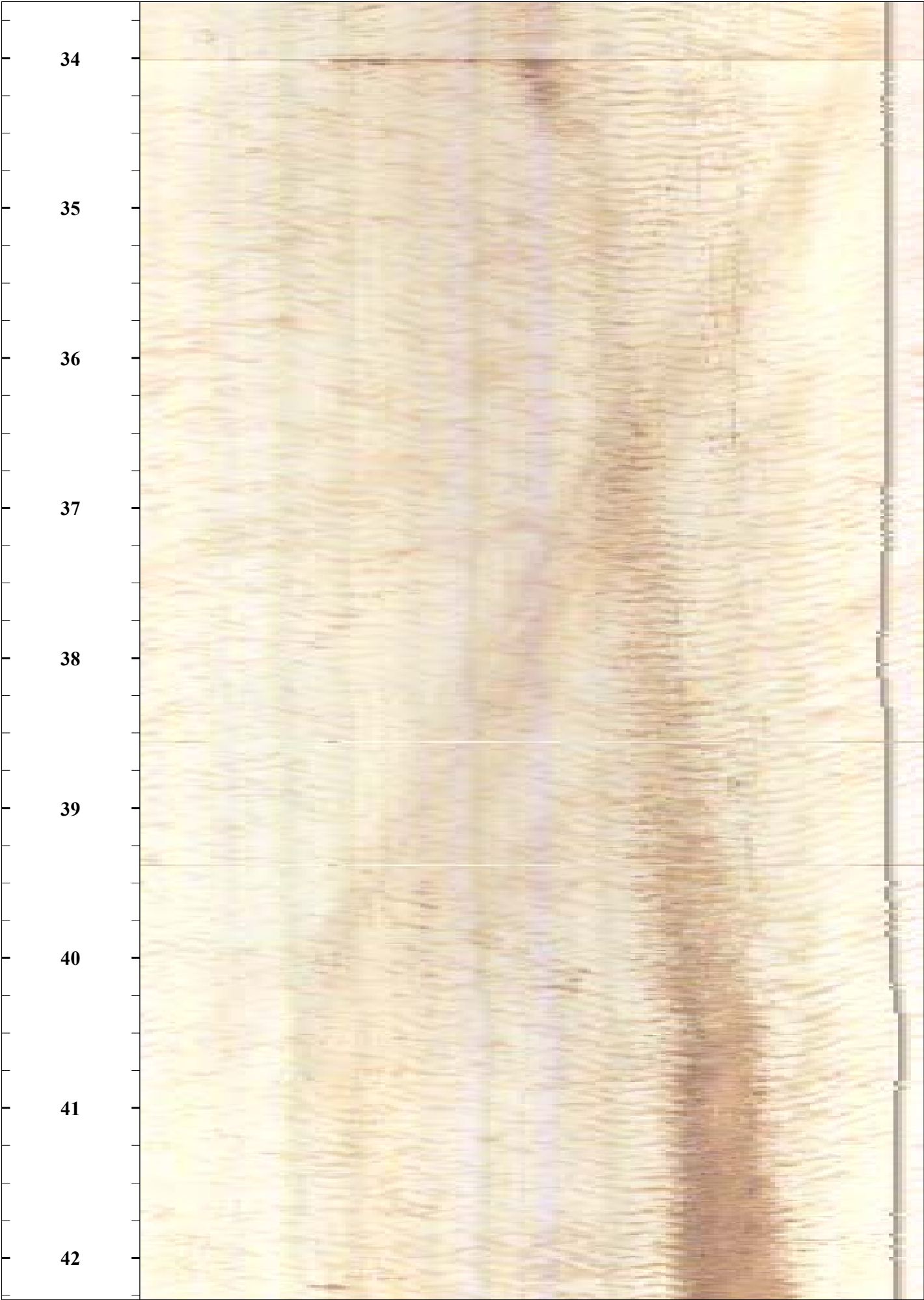


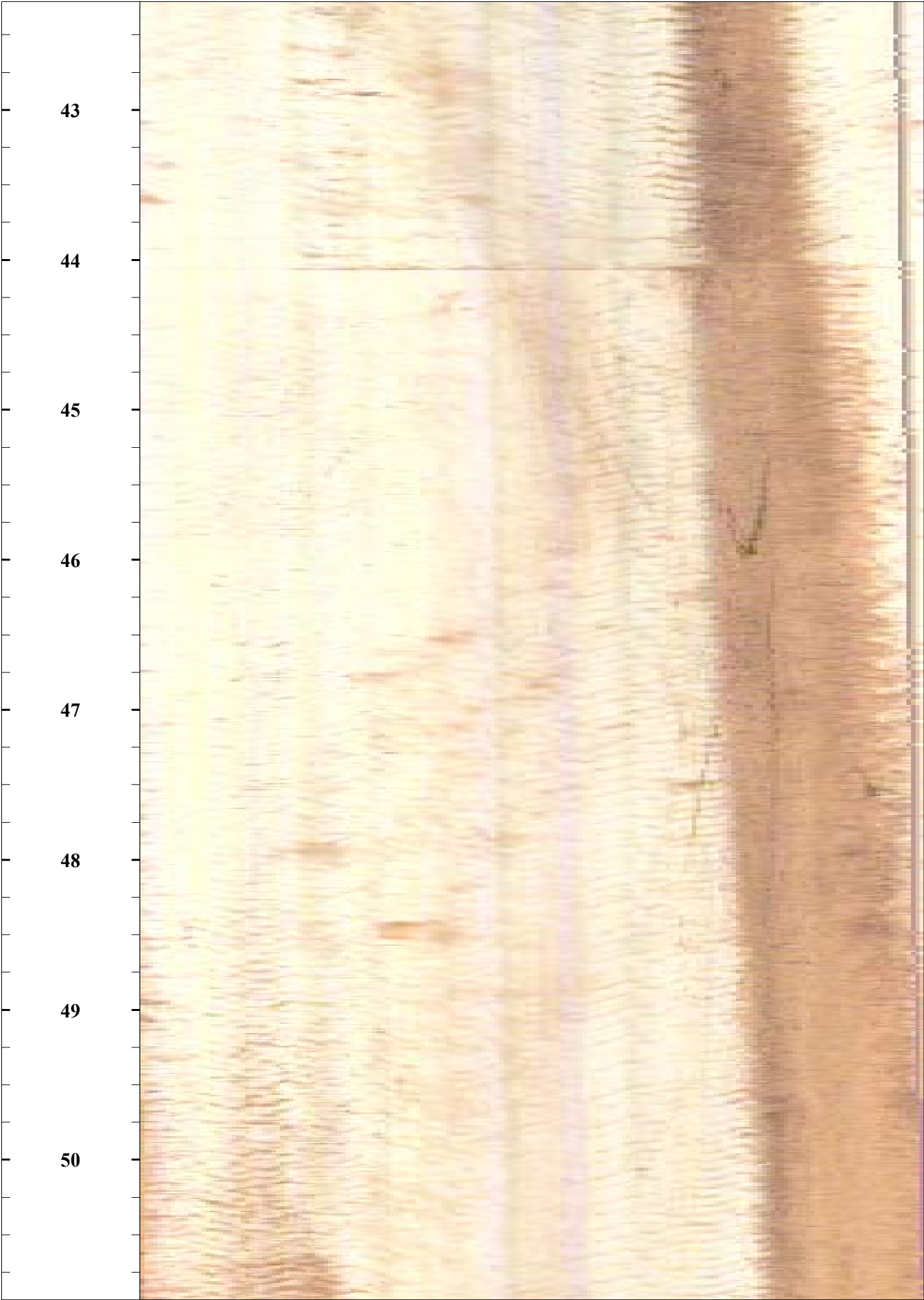


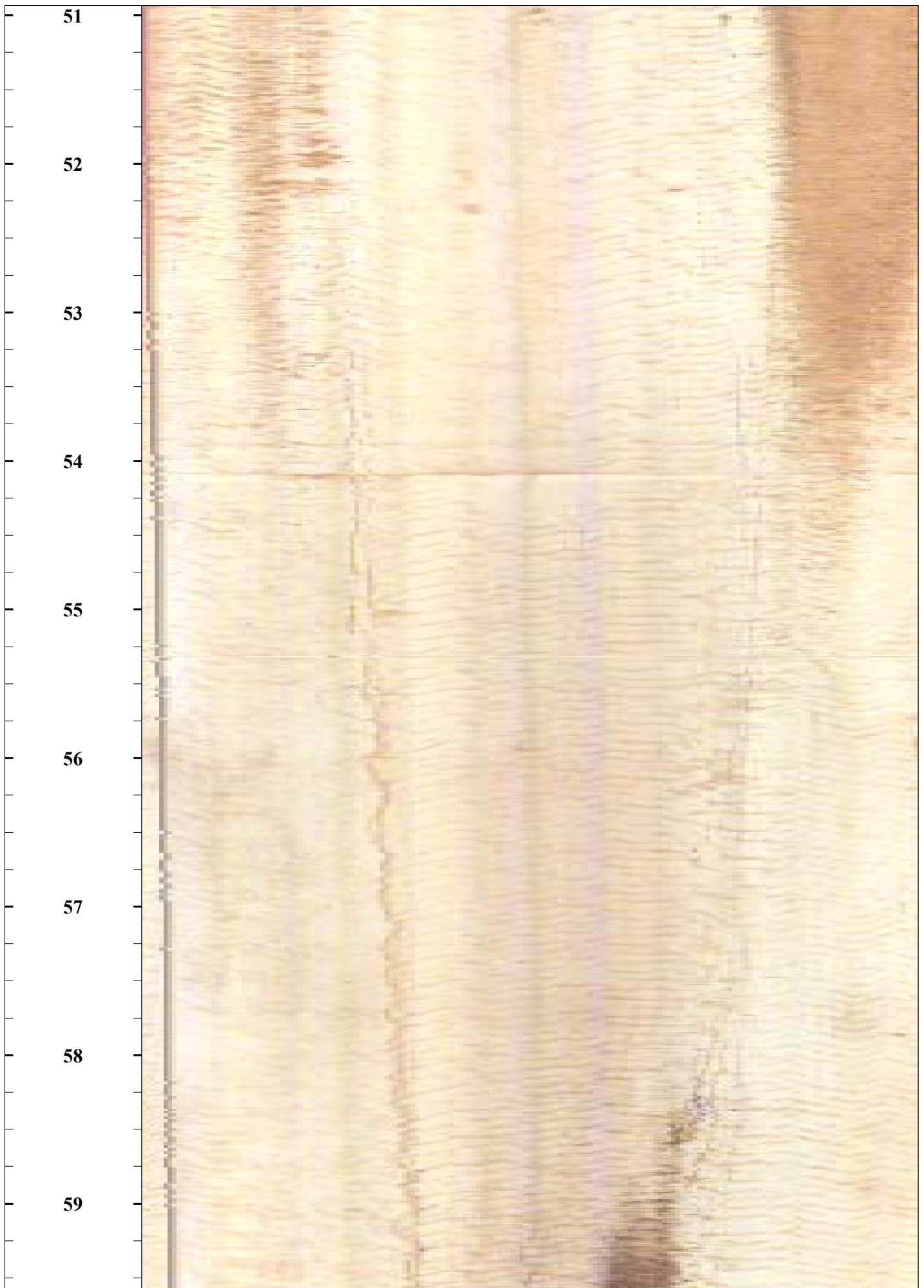


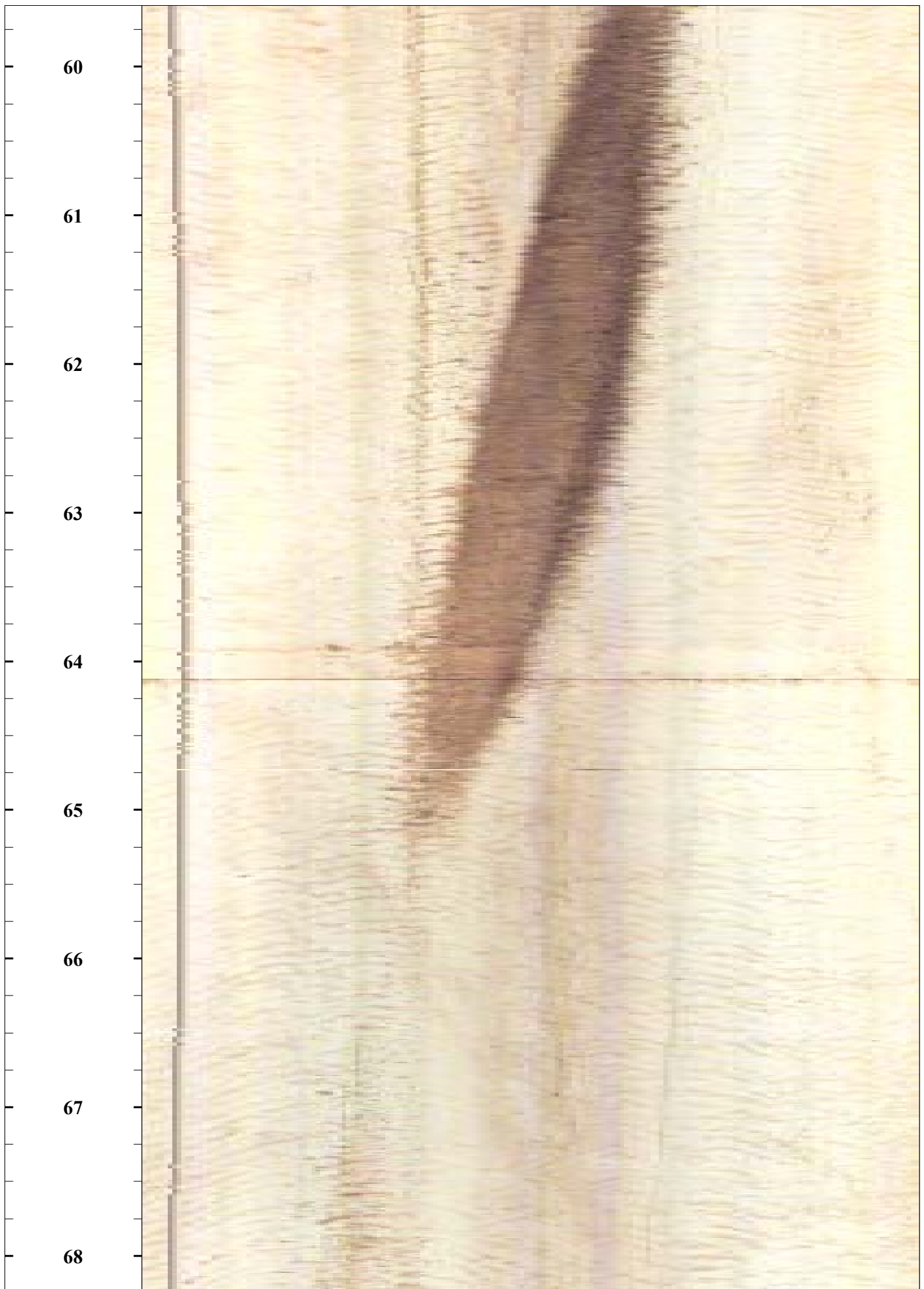


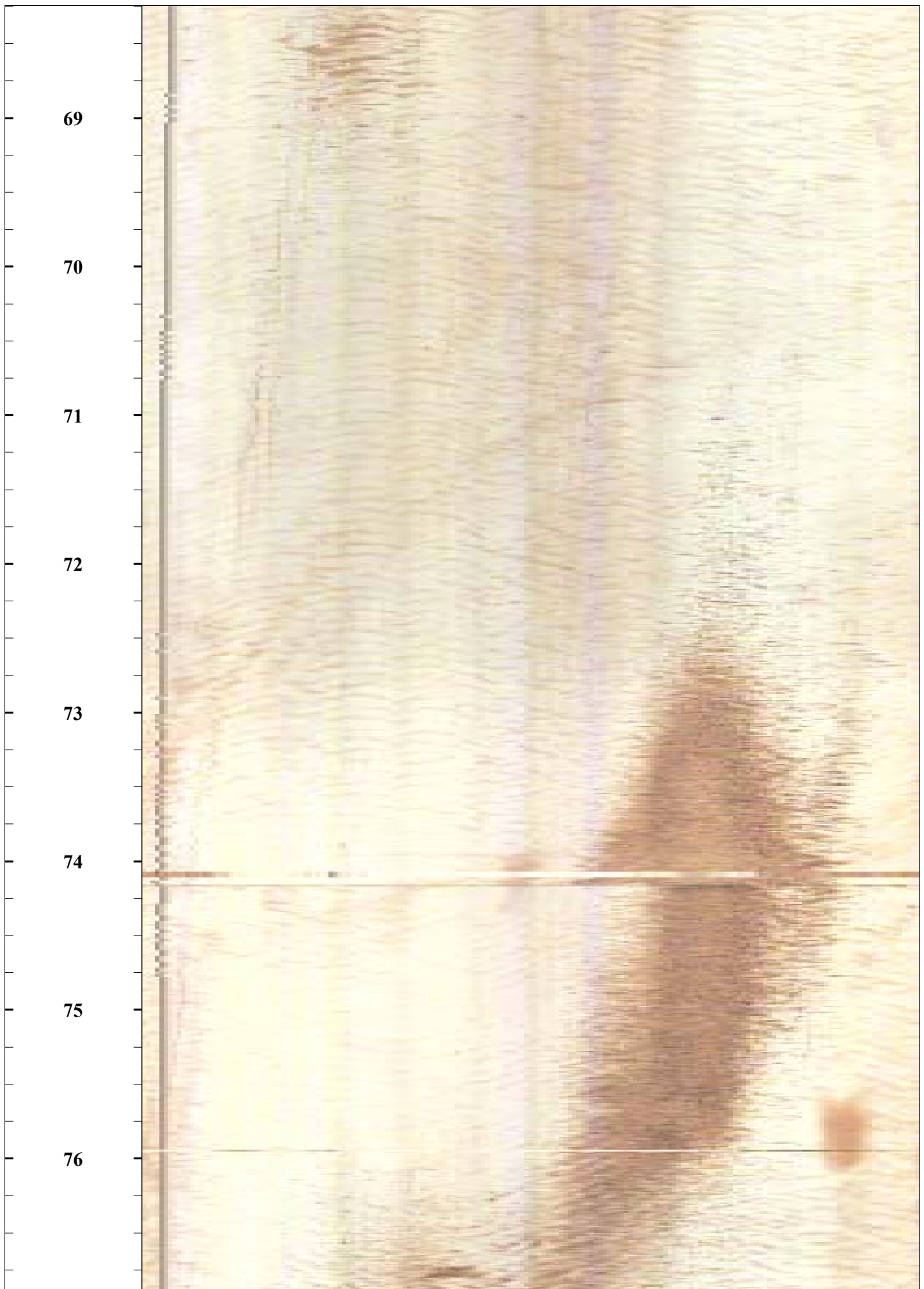


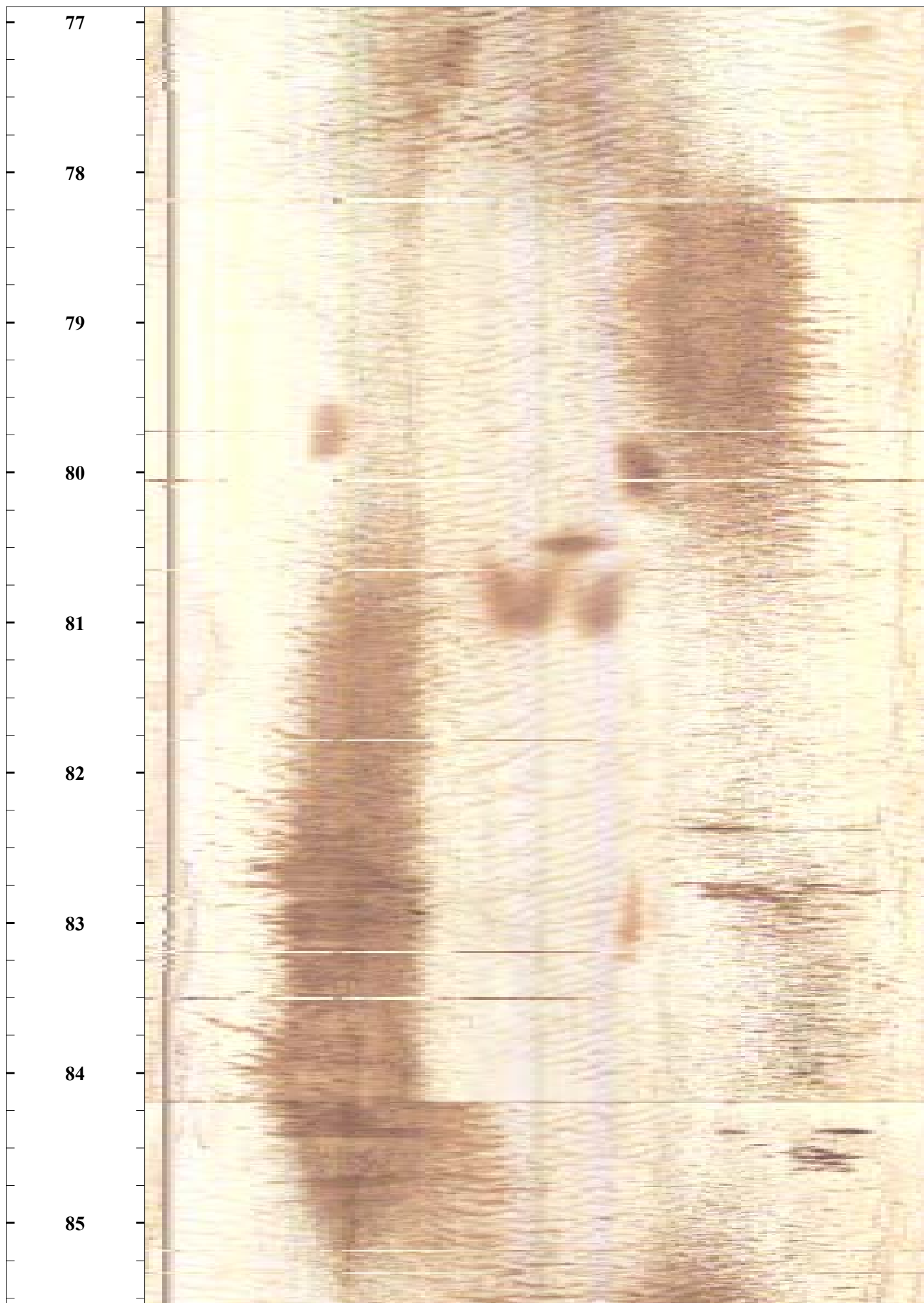


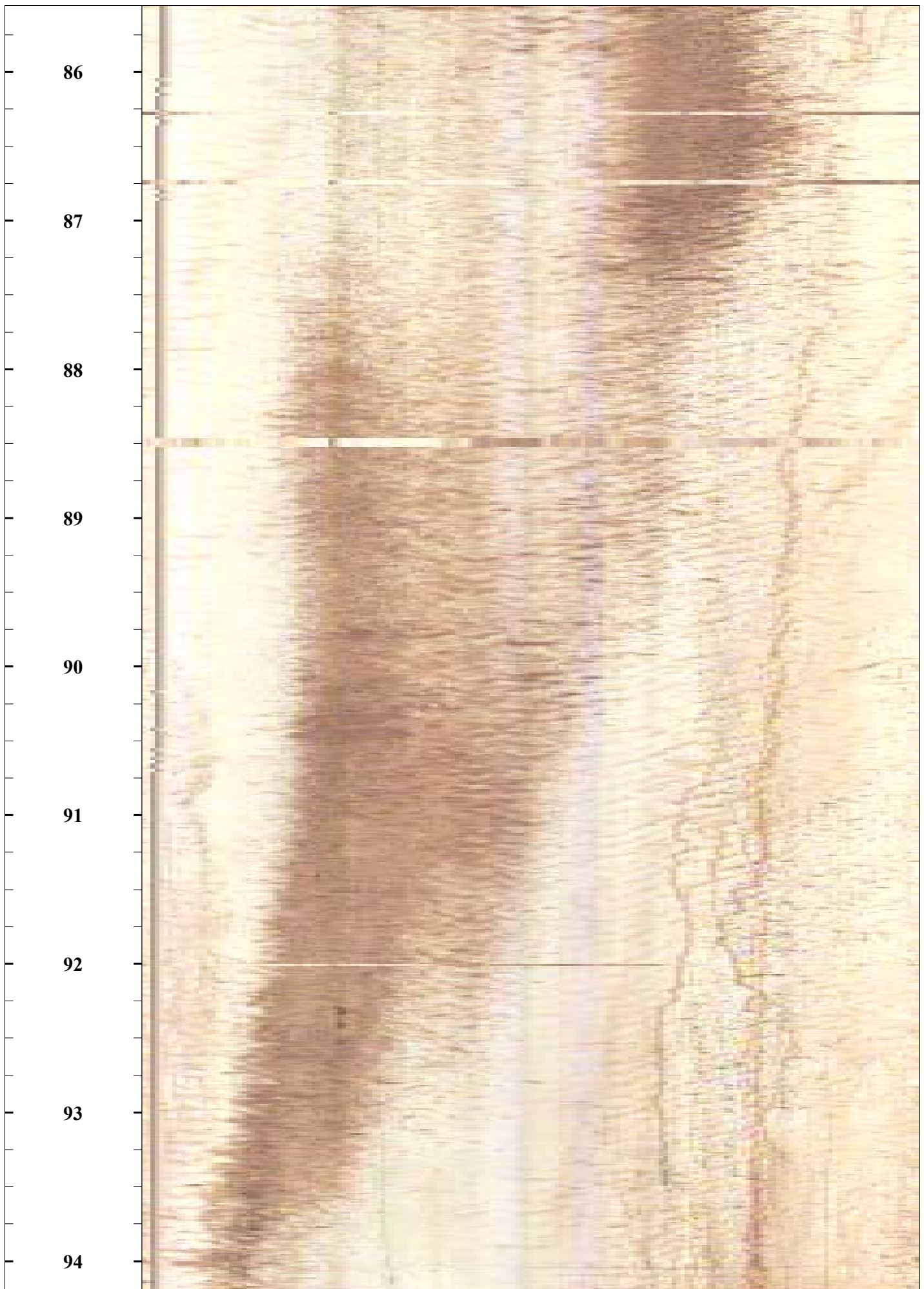


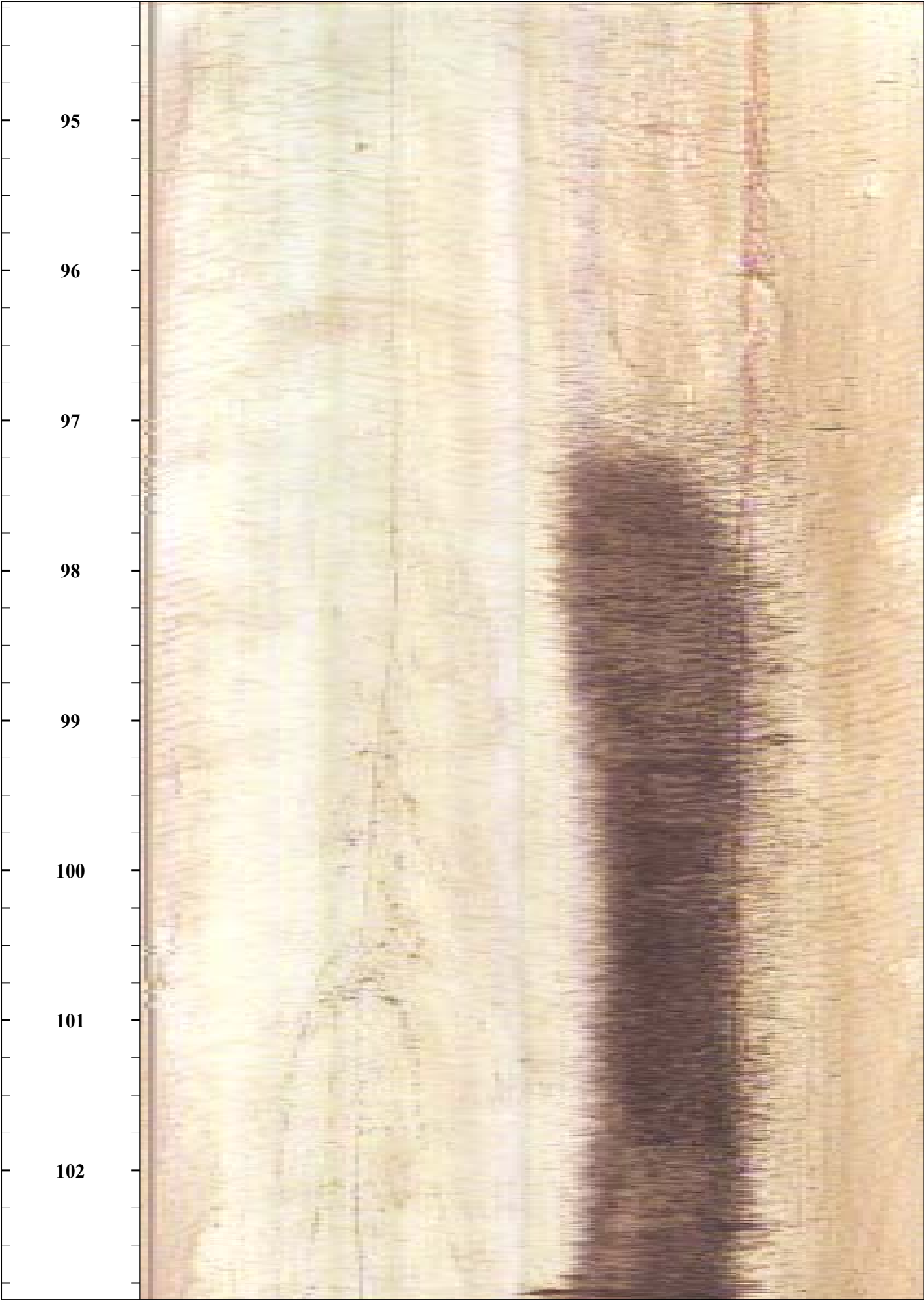




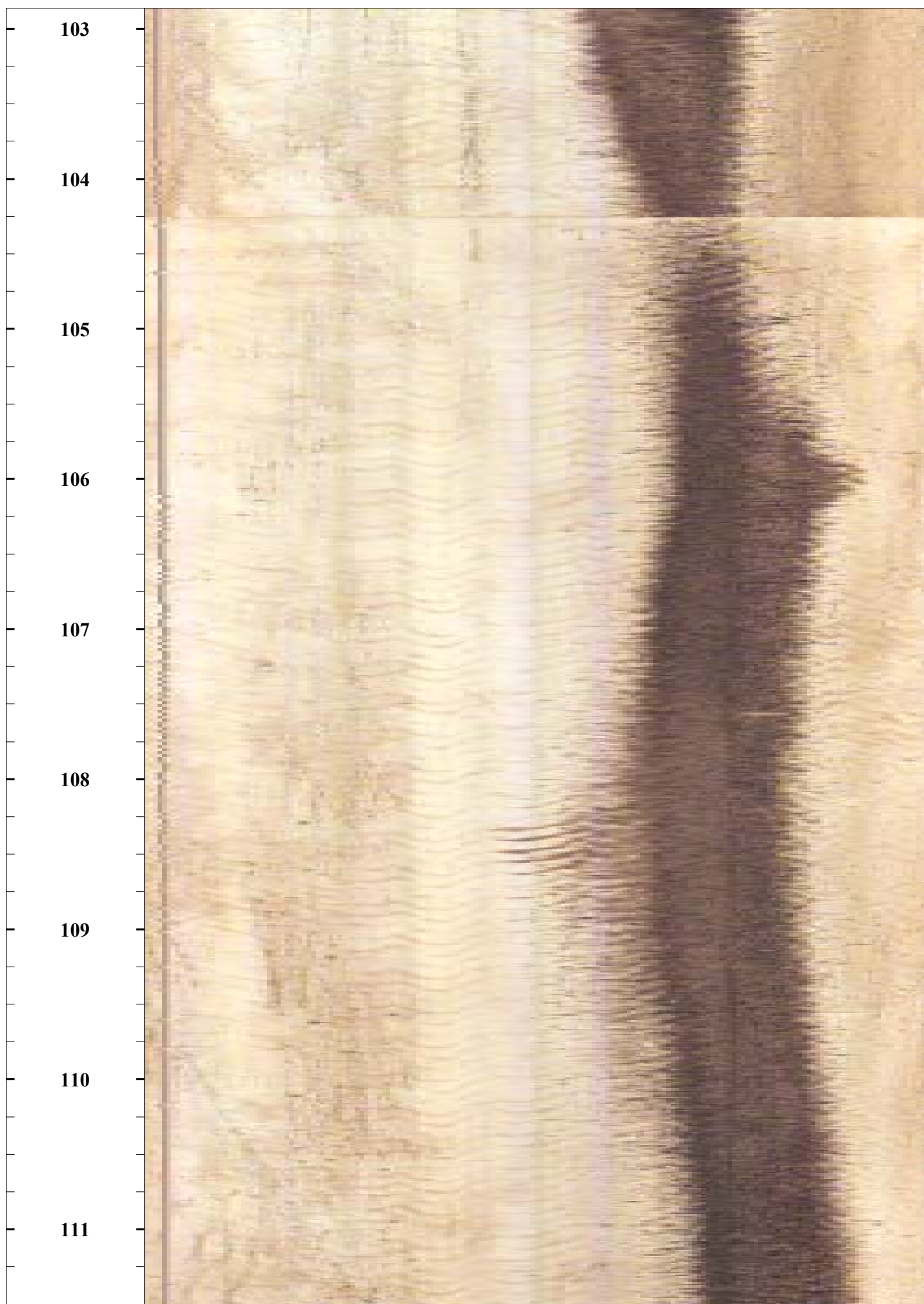




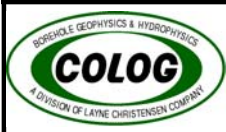










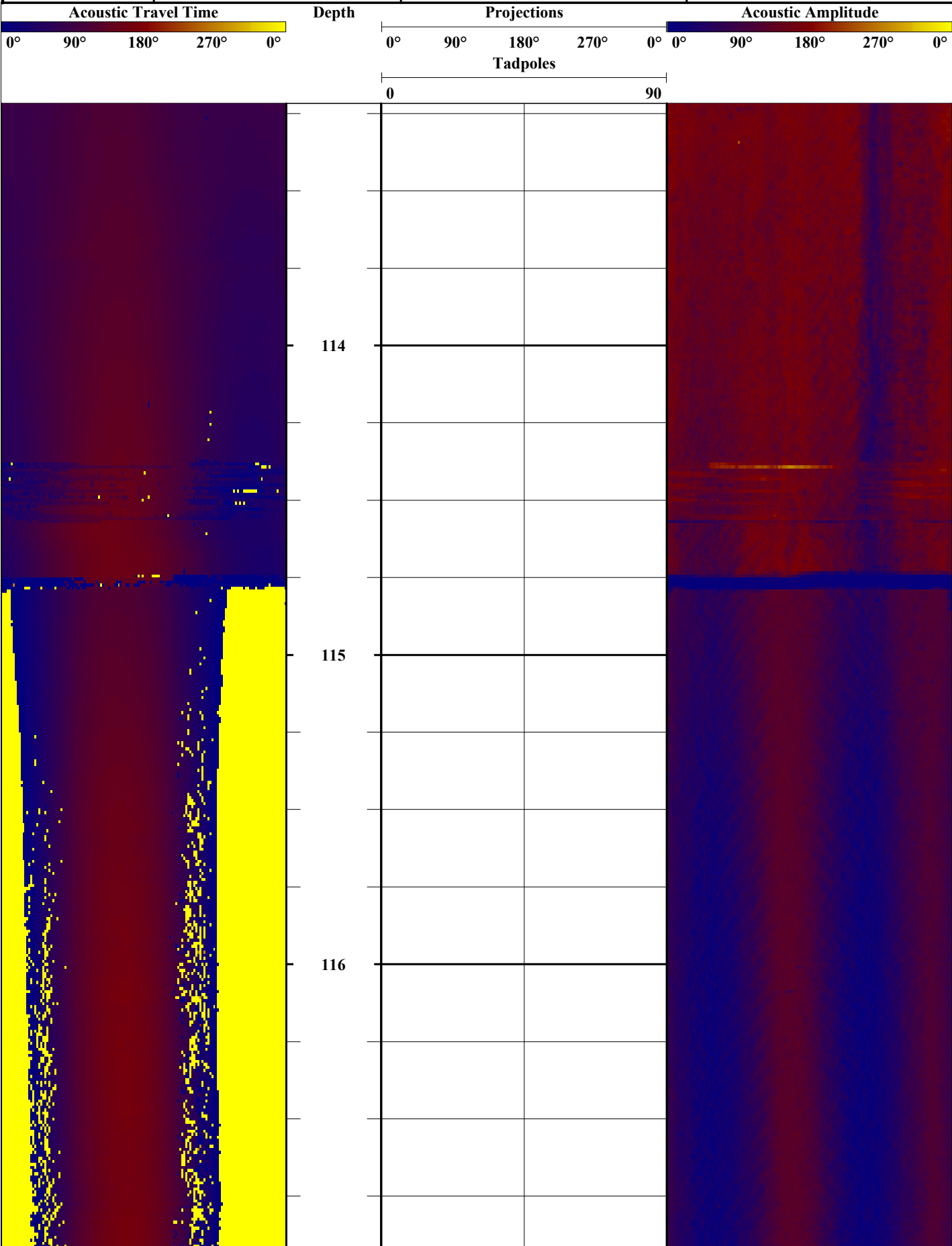


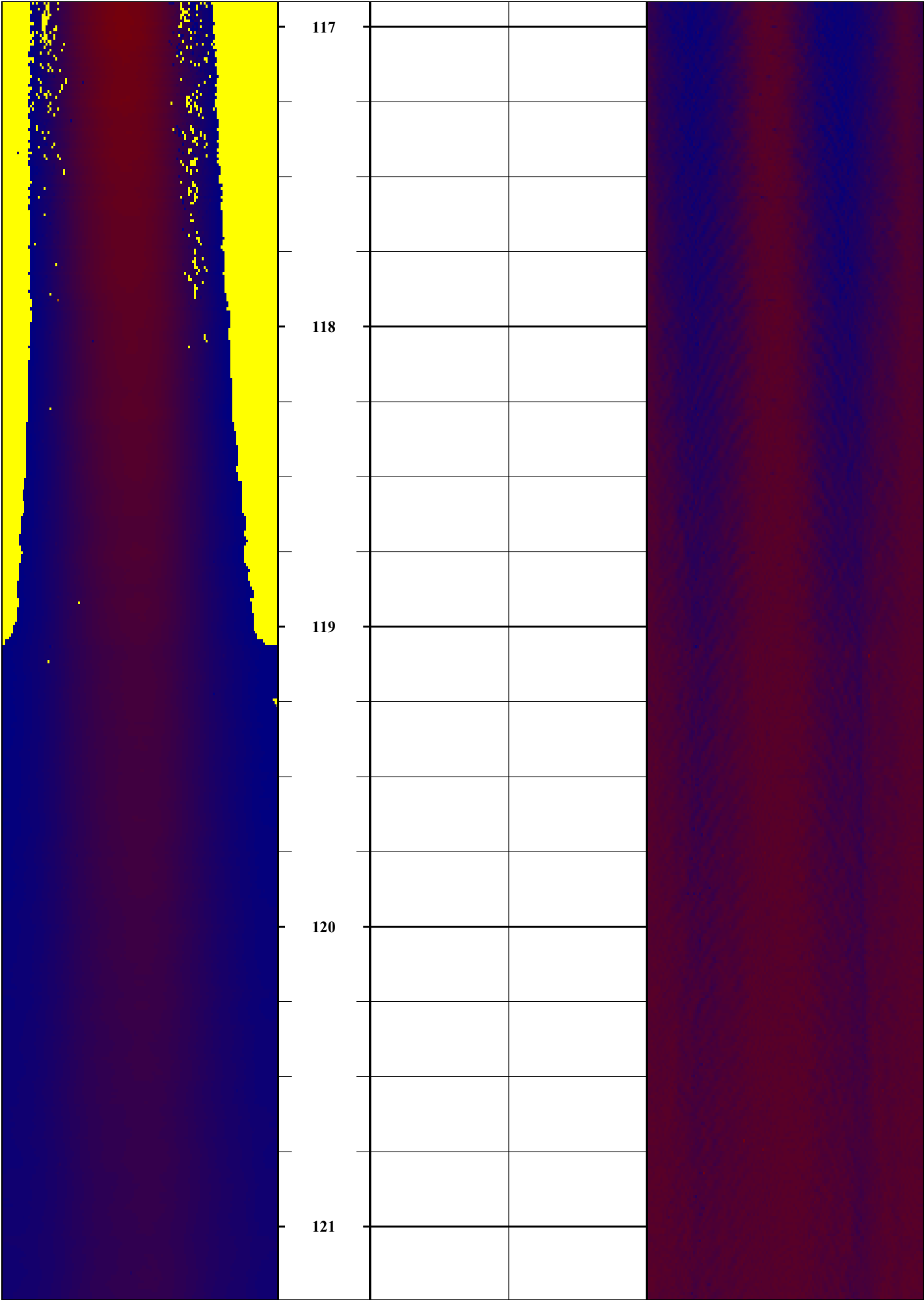
Acoustic Televiewer Image Plot

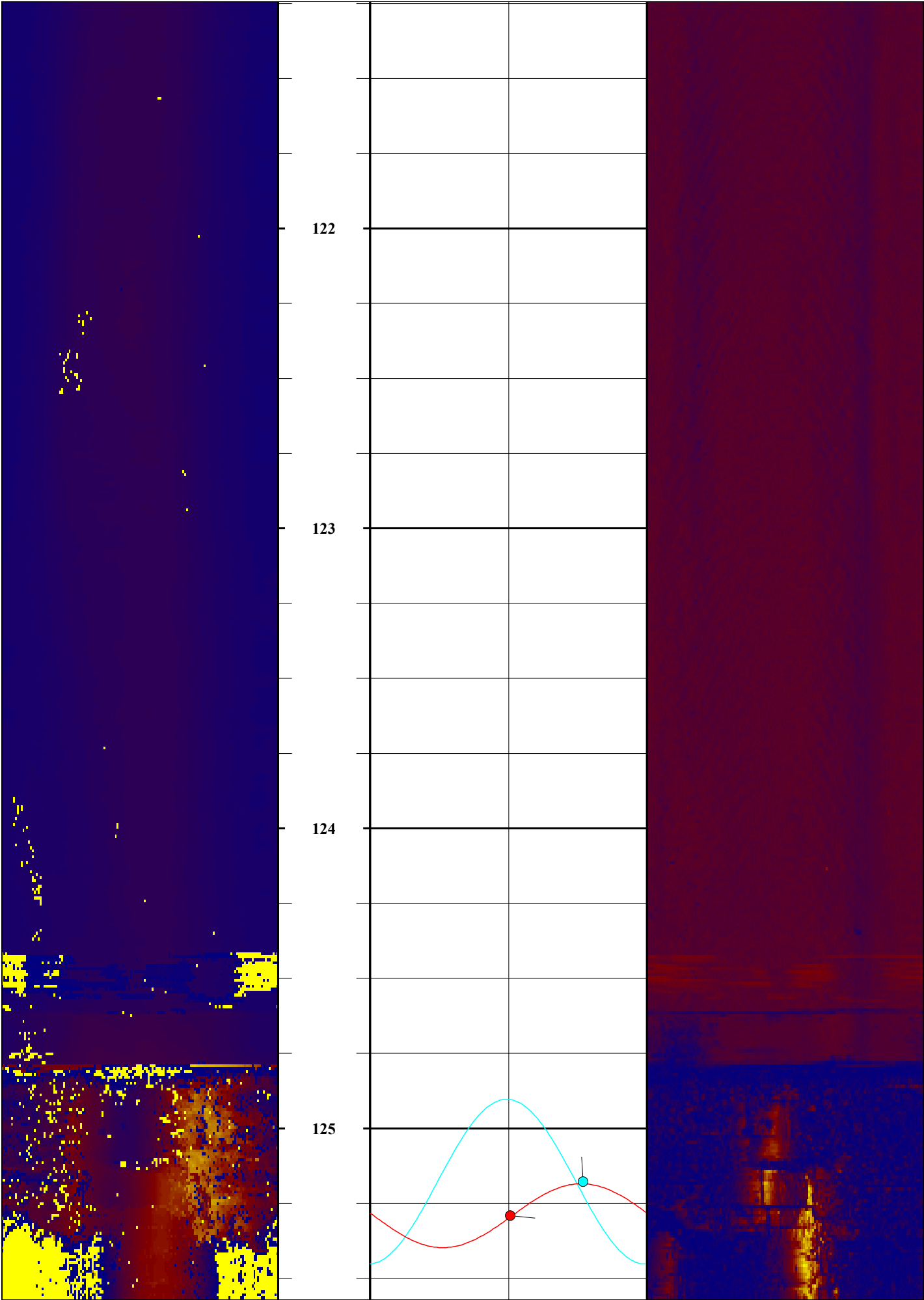
COMPANY: GSI  
DATE LOGGED: 5 October 2005

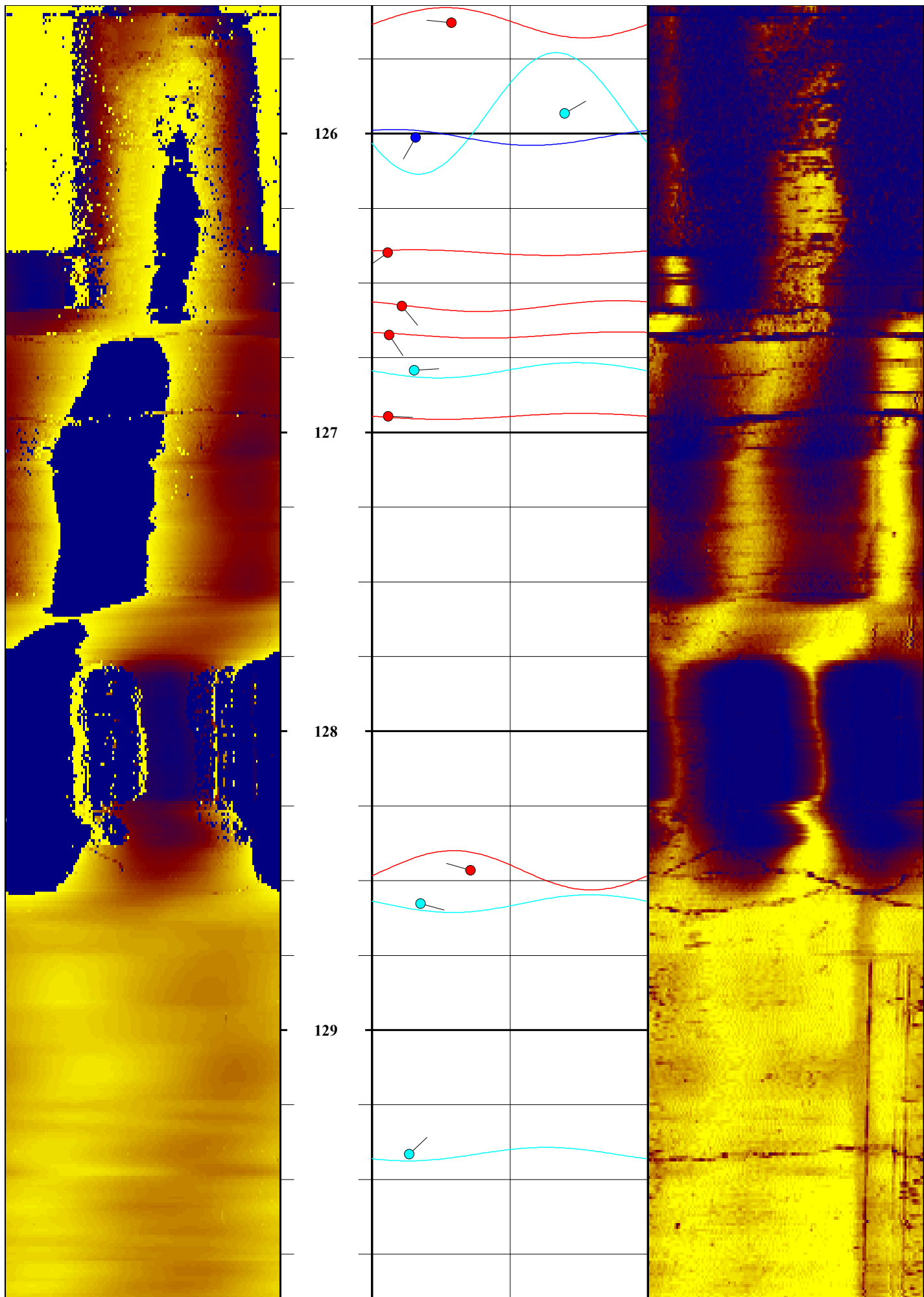
PROJECT: Sauget Area 1  
WELL: BR-I

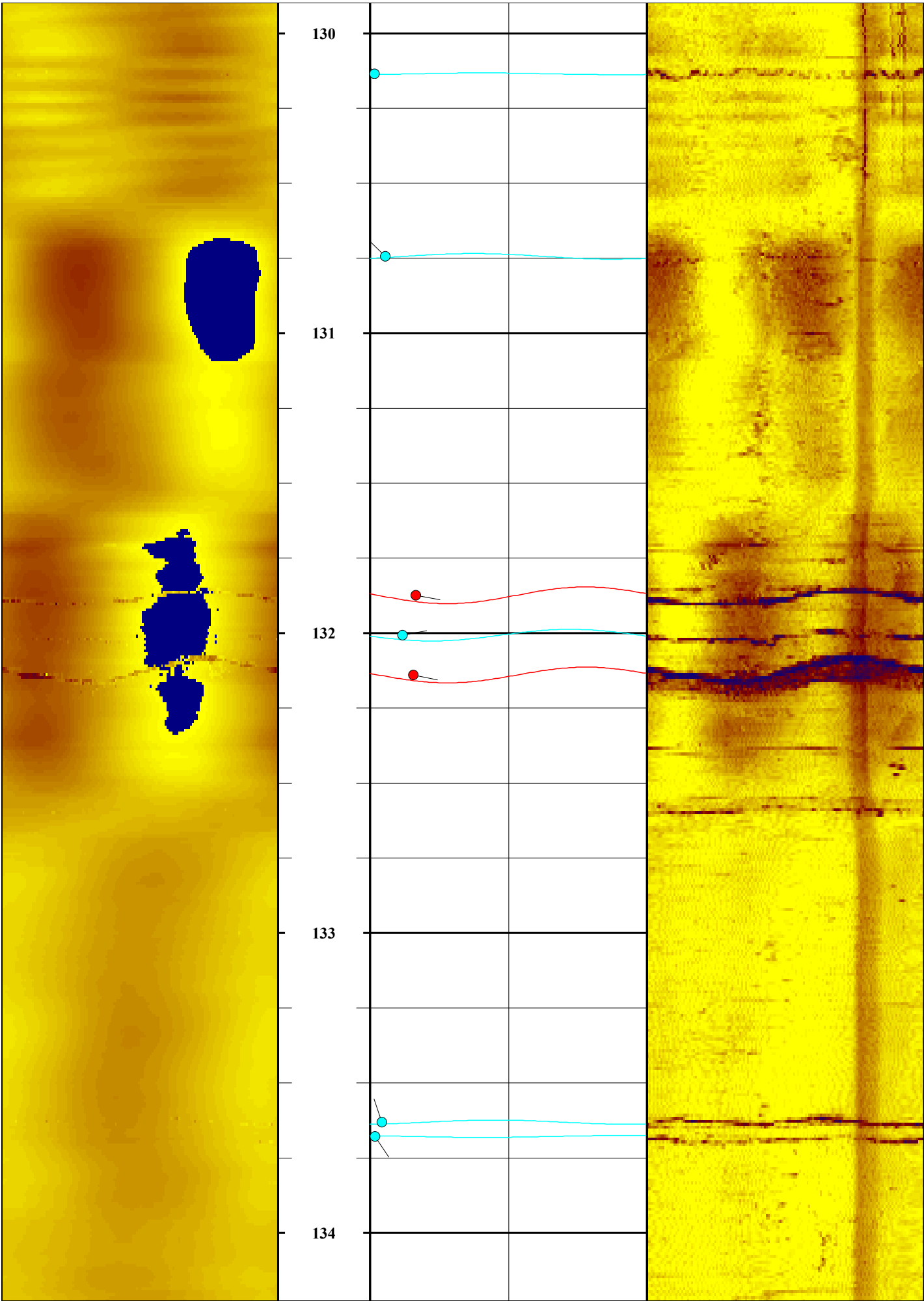
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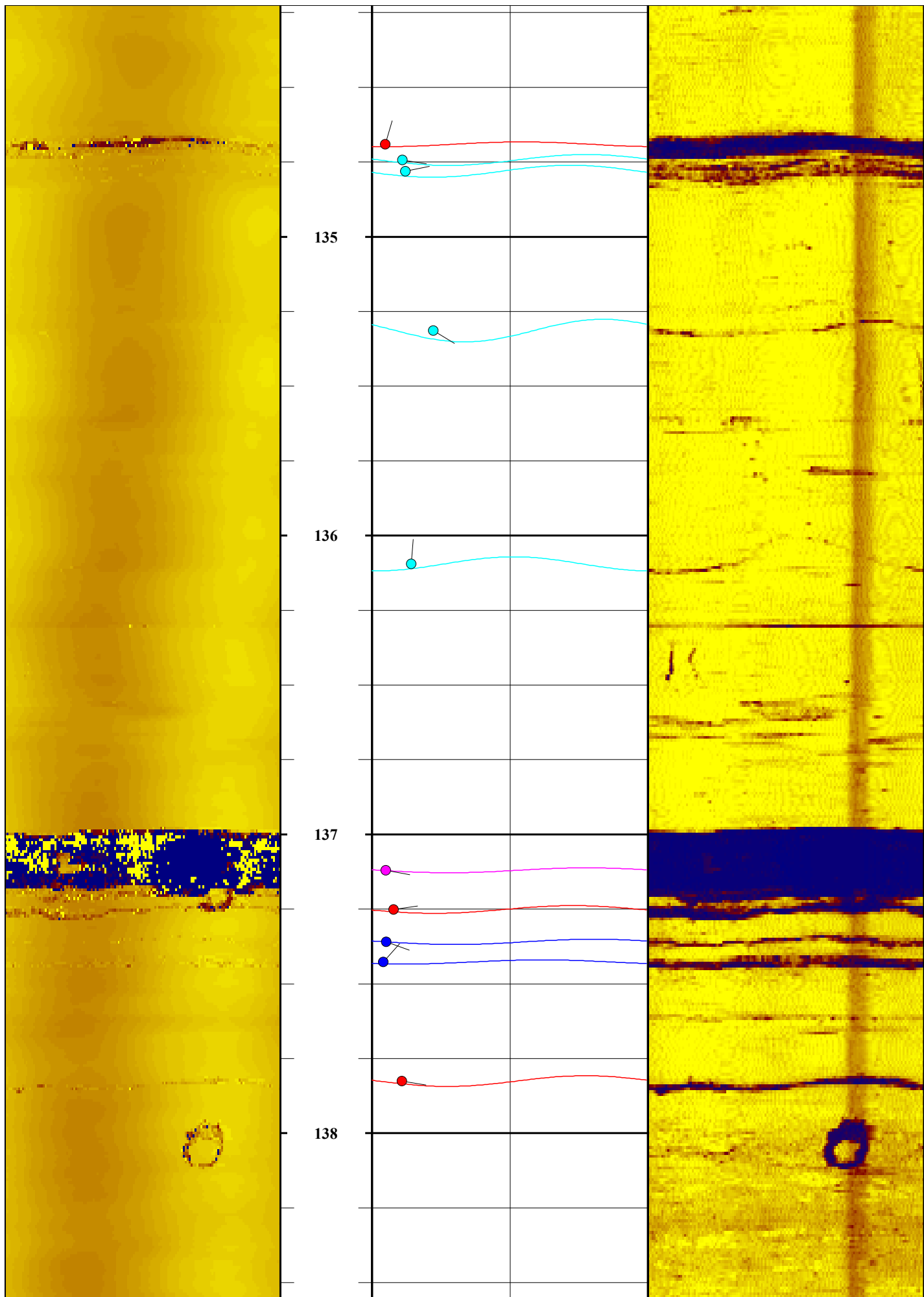




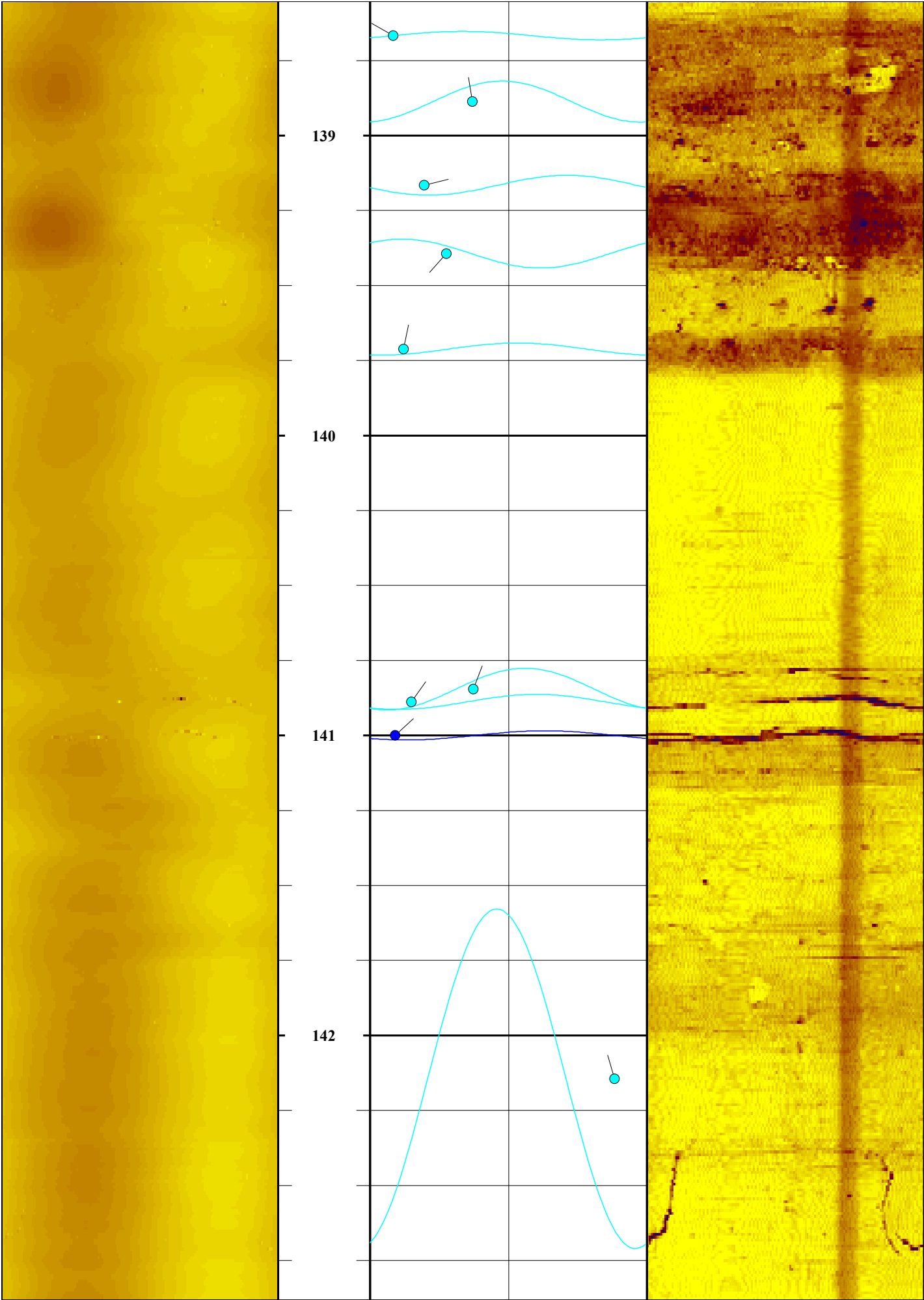


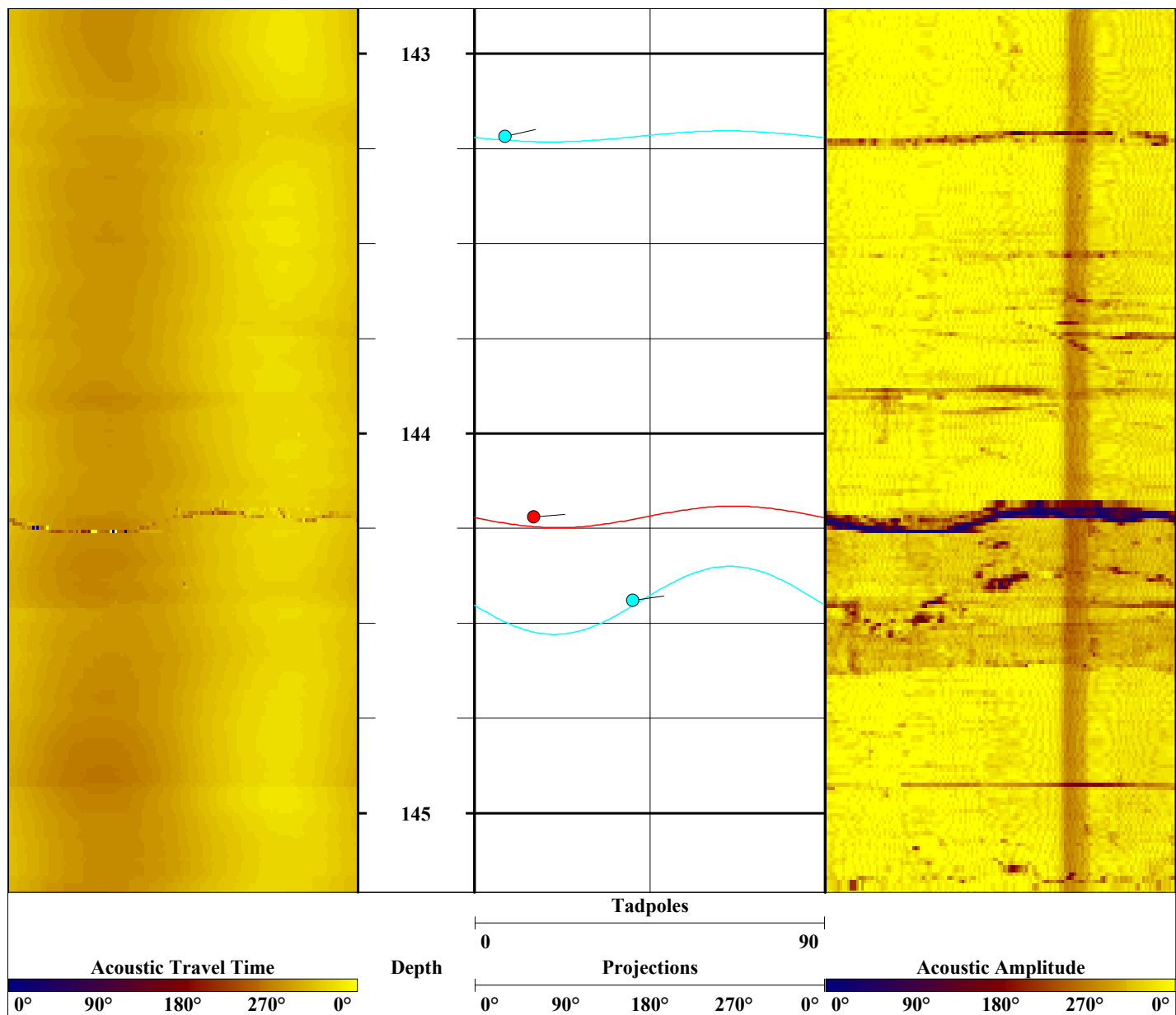


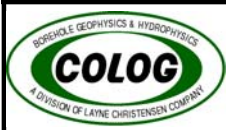












# Acoustic Televiewer Image Plot 2

COMPANY: GSI

PROJECT: Sauget Area 1

DATE LOGGED: 5 October 2005

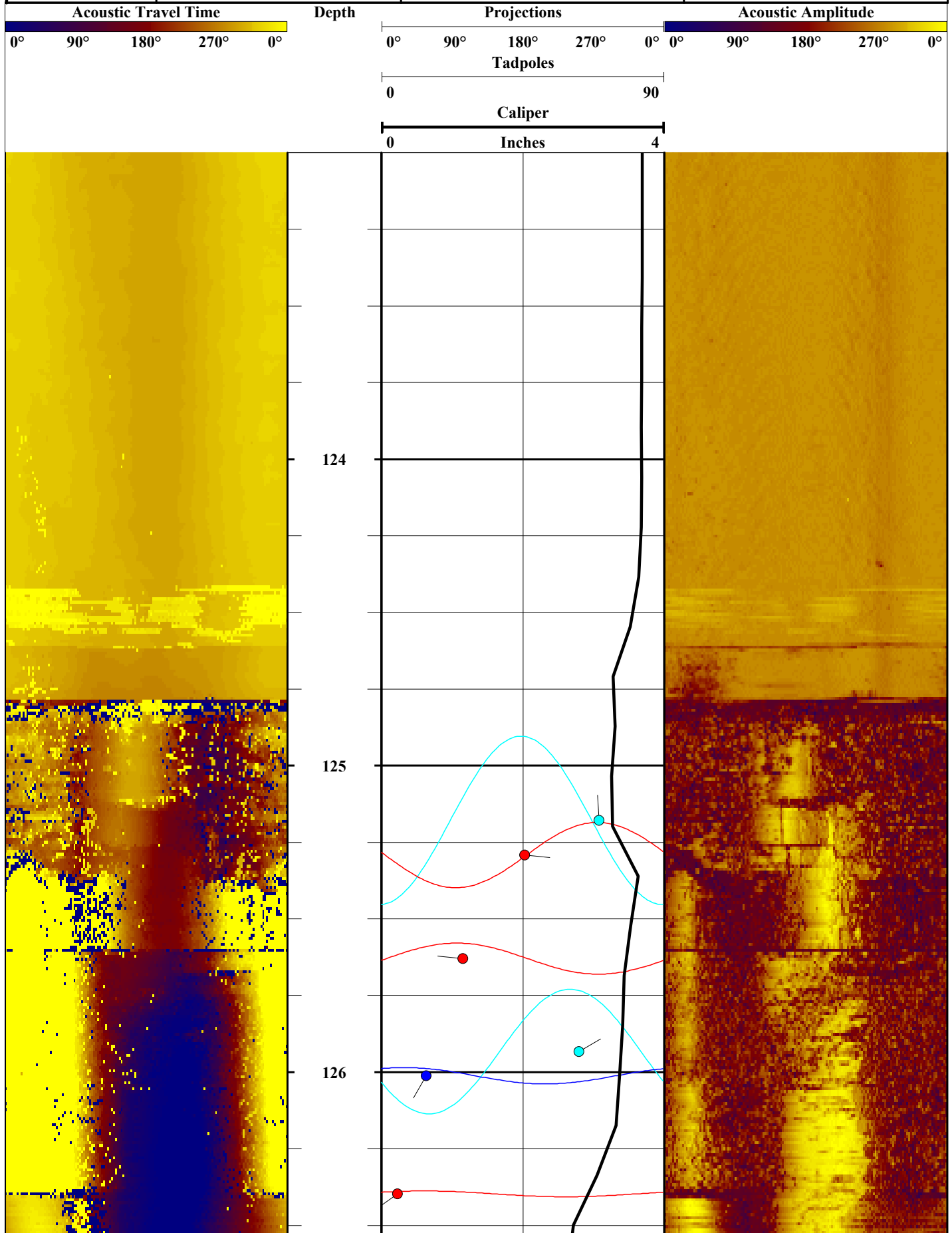
WELL: BR-I

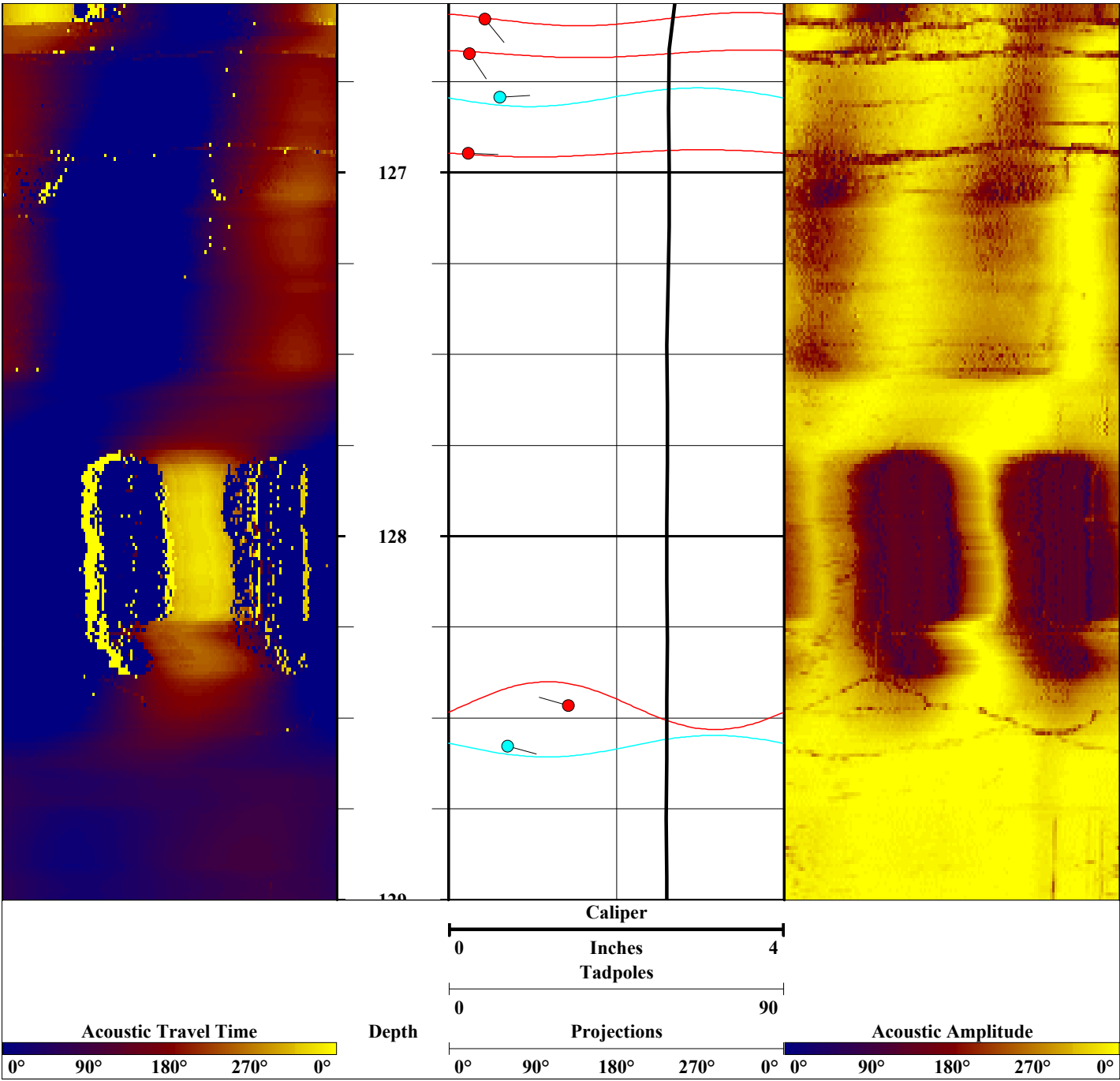
COLOG Main Office

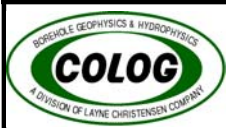
17301 W.Colfax Ave, Ste 265, Golden, CO 80401

Phone: (303) 279-0171, Fax: (303) 278-0135

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Geophysical Summary Plot

COMPANY: GSI

PROJECT: Sauget Area 1

DATE LOGGED: 5 October 2005

WELL: BR-I

COLOG Main Office

810 Quail Street, Suite E, Lakewood, CO 80215

Phone: (303) 279-0171, Fax: (303) 278-0135

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